TECHNOLOGY DEPARTMENT

The CHEMICAL AGE

VOL LIX 31 JULY 1948 No 1516

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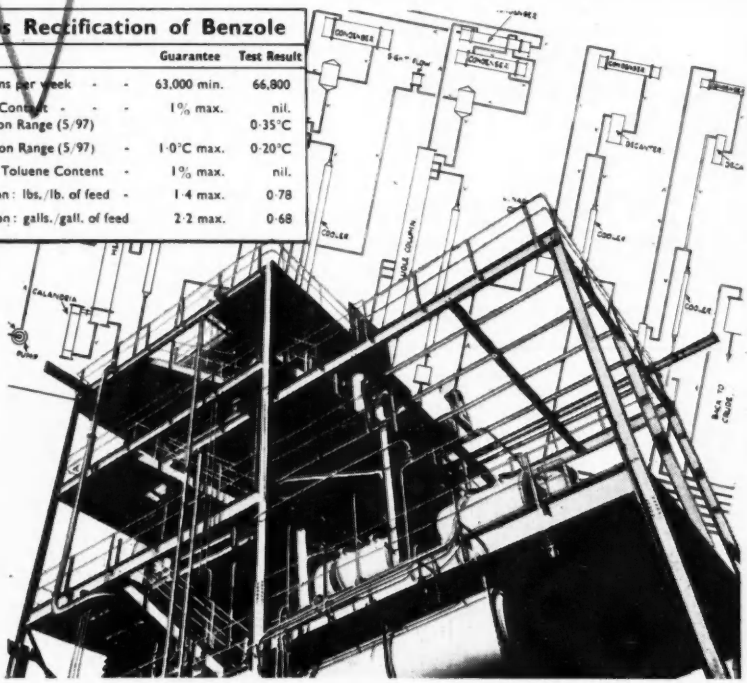
Throughput: gallons per week	63,000 min.	66,800
Benzole: Toluene Content	1% max.	nil.
Distillation Range (5/97)		0·35°C
Toluene: Distillation Range (5/97)	1·0°C max.	0·20°C
Solvent Naphtha: Toluene Content	1% max.	nil.
Steam Consumption: lbs./lb. of feed	1·4 max.	0·78
Water Consumption: galls./gall. of feed	2·2 max.	0·68



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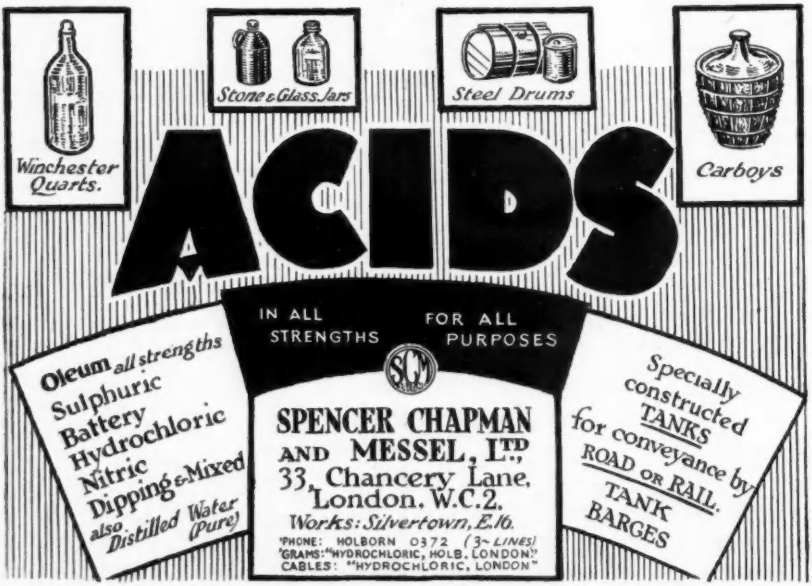

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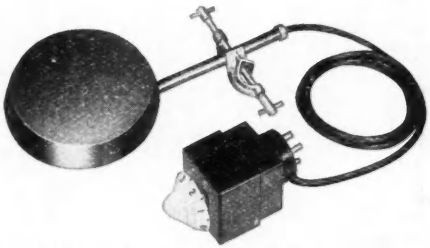

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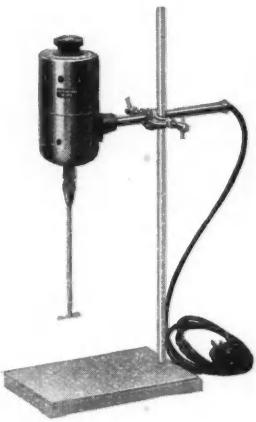

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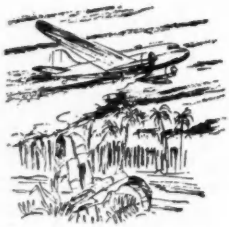

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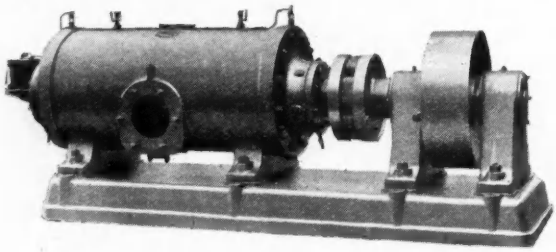

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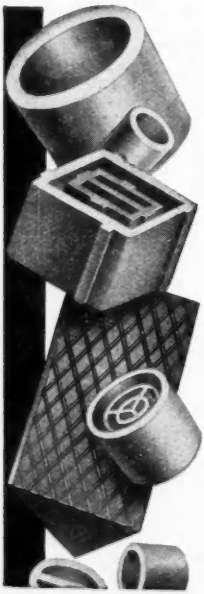

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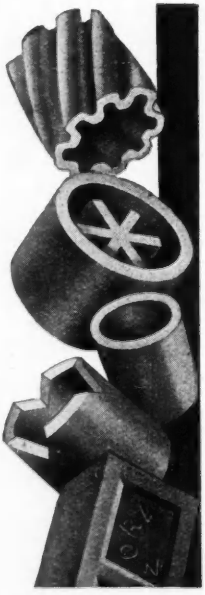

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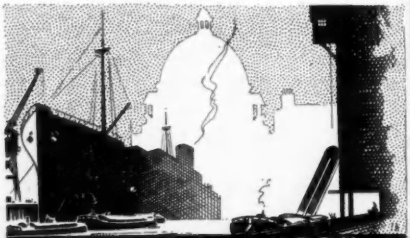

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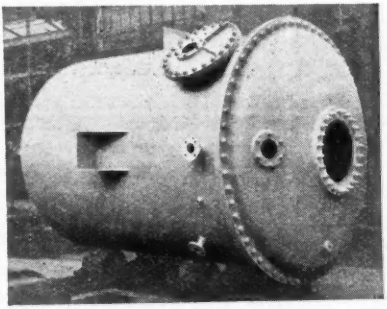

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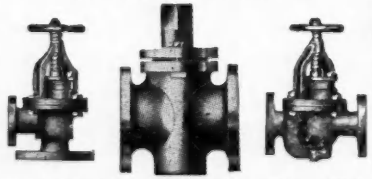

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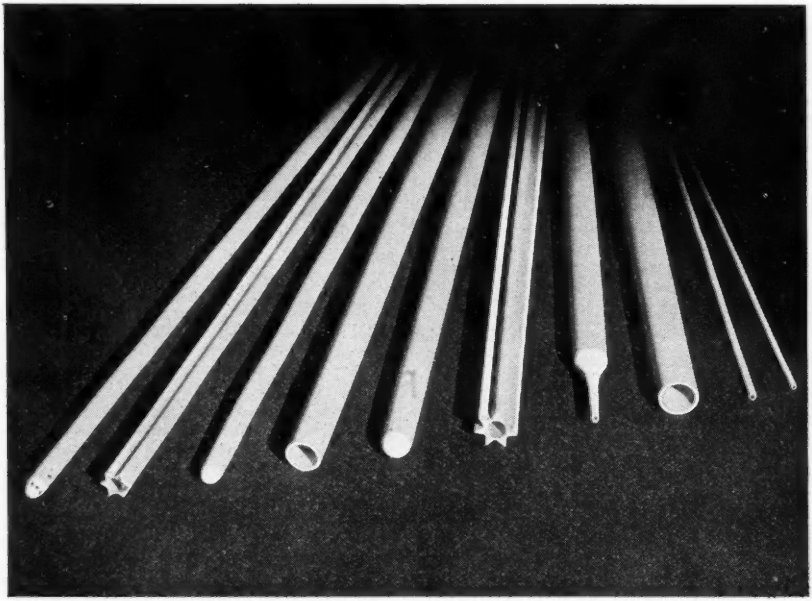

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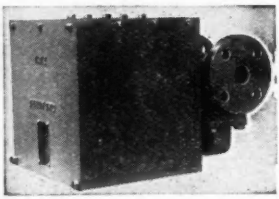

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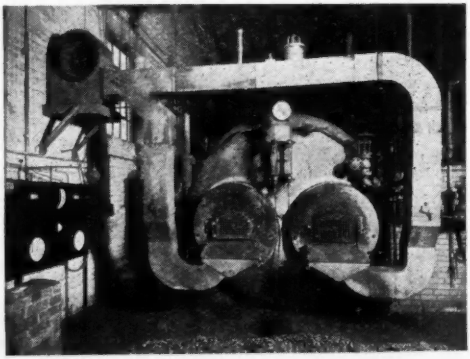

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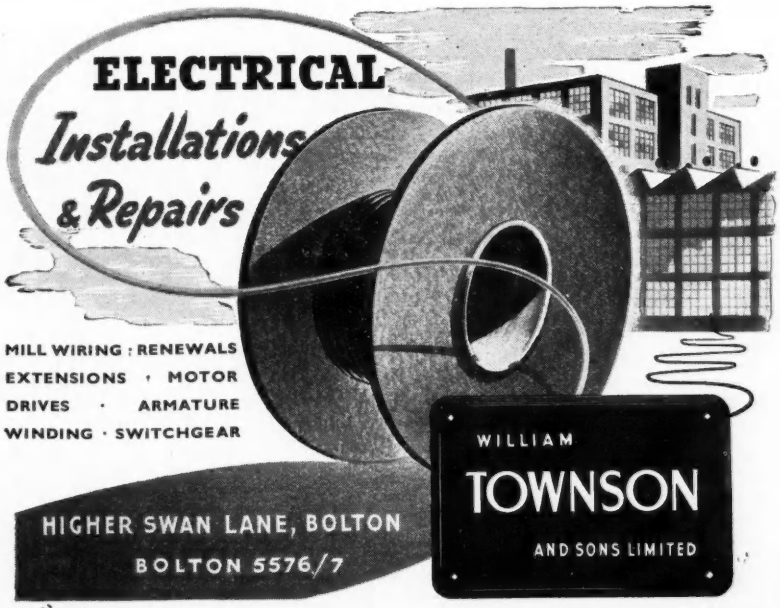

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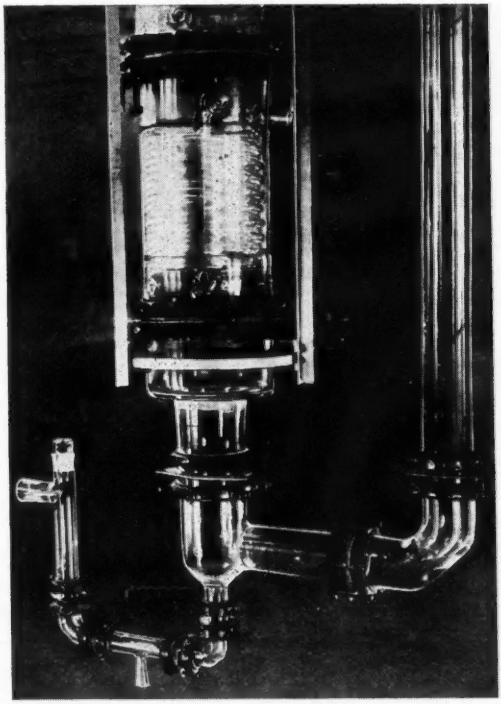

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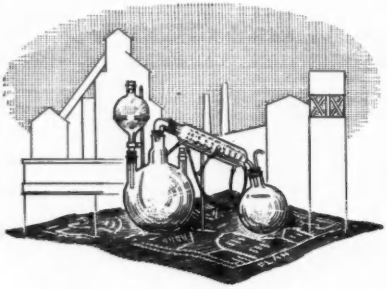

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Benevolent Science

THE current tendency to regard some chemists with something less than confidence and physicists in certain categories with unconcealed alarm is being mitigated to a very large extent by the manifold and conspicuous gifts which the agricultural scientists have made to humanity in comparatively recent years. Here, in agricultural chemistry, is a sphere of service in which the most sensitive of consciences can operate without much fear that any will have reason to regret that the fruits of their research were ever made known. Agricultural chemistry, perhaps the most benevolently constructive of all the sciences, seems to be on the eve of earning further laurels from the world at large—when the results are revealed of what is now being done in the spheres of fertilisers, weedkillers and insecticides.

In the first, there is evidently still much scope for improvement because of the relatively extravagant methods by which most artificial plant foods are used. A hint of the direction in which the next step may lie is the successful application of trace elements very economically by spray. If this method can be extended to include a synthetic bulk fertiliser the results would be of the utmost importance. In the field of weed control there are experimental indications that grain yields can be increased by amounts up to 150 per cent if weeds are prevented from competing with the grain for the available light, air, moisture and plant food. Weeds, " plants growing in the wrong place," are notoriously almost impossible to control by manual methods—as every gardener knows. Probably the most time-absorbing activity in horticulture is weeding the garden; yet no full crop can be won without it. Chemistry has not yet removed that burden, but it has done much to relieve it.

The lecture given recently by Dr. E. Holmes, of I.C.I., Ltd., to the London Section of the Society of Chemical Industry on the subject of plant hormones was rich in its description of achievements that promise great things for the future. The control of weeds by chemical means has long been a dream of the chemist. It has been known for many years that certain naturally-occurring substances have profound effect on the growth of plants. These are the bodies, distinct from fertilisers, which affect the growth of the plant without regard to its food supply. The starting point of this study was a whole sequence of observations, of immense interest to the botanist, but of only modest immediate interest to the chemist, which revealed ultimately that a substance produced in the tips of seedlings is responsible for the rate of growth. These substances were termed " auxins," and appear to have been isolated first from human urine, and later from plants. The constitution of many of them is still unknown, although one of them was identified as β-indolylacetic acid. It was subsequently found that a number of synthetic chemicals could produce the same effects in varying degree, among them being α-naphthylacetic acid, β-indolylbutric acid, β-naphthoxyacetic acid, and the various phenoxyacetic deriva-

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tives. These discoveries are now being used in commercial practice for they have provided a means whereby cuttings of a great variety of plants can be induced to root where they are normally difficult, or to root more quickly than usual, thus doubling the capacity of glasshouses.

Passing over this work and other discoveries stemming from it, it must be recorded that some 40 years ago it was found that certain fertilisers tended to kill broad-leaved weeds without affecting cereal crops. Sulphuric acid in weak solution had the same effect, but for the physical reason that the sulphuric acid stayed on the broad-leaved plants and fell off the vertical grass or crop stems. The use of dinitro-o-cresol was found in France to have the same effect, but was unpleasant to handle.

So matters stood until in 1940 Dr. Templeman, working at the I.C.I. Jealott's Hill Agricultural Research Station on the effect of plant growth regulators (" plant hormones ") on the total growth of various crops, noted that the germination of weeds could be suppressed while that of the crops was unaffected. The quantities required were too large to be economic, and research conducted by Dr. Sexton at the I.C.I. Dyestuffs Division laboratories resulted in the discovery of two chemicals now well known under their trade names of Methoxone and Chloroxone (2-methyl-4-chlorophenoxyacetic acid and its di-chloro derivative). Independently, but at a later date, similar discoveries were made at Rothamsted and Yonkers, U.S.A. Publication was withheld for war reasons, until the results were published in *Nature* on April 28, 1945.

At present this is an empirical discovery. It was the result of fundamental botanical work leading to a chance observation. Even now, it is not known how these chemicals work. Their effects are shown by the marked twisting and discoloration of the stems and leaves of weeds, by a thickening and weakening of the stems at soil level, leading to the death of the plant. Some plants die quickly, some may require five or six weeks to die; heavy rain immediately after application may frustrate the action of the chemicals. Plantains, buttercups, daisies, thistles, charlock and other weeds can be removed, leaving the grain crops, grass, etc., unaffected. The fact that the material may be sprayed or dusted adds to its practical usefulness.

Nevertheless, the fight to exterminate the weed is, of course, as yet not nearly won. Not all the weeds can be removed from cereal crops, although the major ones, particularly charlocks, are effectively killed. Many tropical weeds, being of the nature of grasses, are not affected, and it is evident that this method cannot yet be applied

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NOTES AND COMMENTS

Still More Exports

BY raising export sales by over £800,000 since June last year—from £3,056,900 then to £3,893,387 last month—heavy chemical producers have convincingly demonstrated their capacity to contribute more than most other industries to the balancing of the national trade account. Even more reassuring than the conspicuous improvement on the figures recorded a year ago is the gain of over £17,000 since May (disregarding drugs and dyestuffs) and the continuous testimony since the beginning of the year that the upward trend in overseas trade is no transitory result of a seasonal change in demand. The magnitude of the achievement has been emphasised by the fact that in a recent review of production (summarised on page 144) even the Chancellor of the Exchequer was moved to praise. Many factors have presumably contributed in raising the grand total of chemicals, drugs, dyes and colours from £5.59 million in June, 1947, to £7.16 million last month; among these a definite contraction of demand in some sections of the home market for chemicals may have facilitated larger shipments to all those markets which are not too closely hedged by import and currency restrictions.

Colour Problem

TO a cursory glance, the difference in conditions of supply to manufacturers and users of chemicals in this country and the U.S.A. seems a more fundamental division than that of the Atlantic itself. It is all the more interesting to note that we have some scarcity problems in common, for example, in the dyestuffs range in which American reactions have a useful bearing on our own difficulties. So pronounced has been the shortage of dyestuffs in the U.S.A. for some months past that manufacturers, customers and the relevant Government department have been speaking sourly of the " grey market " and recommending export controls. They have had to recognise an important consideration, with which we earlier were familiar, that the overseas dyestuffs markets well deserve nursing, now that the withdrawal of the ruthless German and Japanese near-monopolies has opened the gates. " It is no secret "—says the U.S. *Chemical Industries*—" that a small part of the domestic dye output has been diverted—at fabulous profit—to the export grey market." One result was that sulphur black went from 27 cents per lb. to $1.80. Conditions here have prevented any comparable pressure on quoted prices, but the diversion of supplies along subterranean channels is not peculiarly an American problem. The U.S.A. is fortunate in being able to provide the only permanent cure for all such markets, grey or black—fuller production. " Now," says *Chemical Industries*, " the grey market is getting whiter all the time."

Foreign Aid

THE inclusion of large quantities of heavy chemicals among most of the commodity " budgets " which have lately been prepared in the U.S.A. in implementing the foreign aid programme is being regarded with mixed feelings there and in some other producing countries. The need of some such aid from the West to supplement temporarily existing sources of some of these chemicals, particularly fertilisers, is not doubted, but what will be the effect on American prices now that $7000 million —the first quarter's foreign aid total—are being released to compete with American domestic purchases is the subject of anxious study by users and the ECA. The latter, well aware of what generally results when too many dollars seek too few commodities, has declared its firm intention of averting the creation of dollar waterspouts in American and other supplying areas, without being very specific about the means. Possibly the power to withhold dollars will be the answer if there is a repetition on an even larger scale of the hard bargaining which has characterised much of our own purchasing in South American countries since the war. In any event, world prices of chemicals are certain to move in the opposite direction to that in which some English supplies have been going, in recognition of the Government's appeal for price stabilisation or reduction. Restraint of that kind, however, is not generally practised in the American economy, so that in the months immediately ahead the outlook for the buyer and consumer in the U.S.A. must be fraught with justifiable anxiety.

Already, notwithstanding export controls on nearly half the goods normally exported, the U.S.A. is suffering from widespread inflation.

The Chemical Torch

THE contribution which chemistry and metallurgy is required to make even in such matters as the successful organisation of the 1948 Olympic Games is made clear in a Press statement emanating, somewhat oddly, from the Fuel Research Station of the DSIR. The connecting link is, of course, the Olympic torch—or torches, for there are numbers of them distributed at short intervals right across Europe. Instead of the pinewood brand steeped in resin, the contemporary Olympic courier carries a very scientific contrivance which required the combined efforts of metallurgists an architect (for the design) and fuel technologists. The entire operation resulting in the production of the 1948 torch was carried out on the most approved lines of development research. Several types of fuel were studied and minor pyrotechnical problems overcome before prototype torches were handed to the South London Harriers and officers of the R.N. College, Greenwich, for trial runs. For the final model, which has been lighting the way of some 1600 runners across Europe, the Fuel Research Station chose as fuel hexamine in tablet form, and, noting that the flame was more or less non-luminous, added six per cent naphthalene. The torch makers probably had also in mind the possibilities of international misunderstanding which might otherwise have arisen from the handing on of an invisible flame without prior warning which was the hot end.

A Great Metallurgist

A FURTHER reminder of the widening of the scientific field from which medicine and surgery depend for much of their service to human welfare is contained in the record of achievements over the past 40 years of Dr. Clarence William Balke, whose recent death is lamented by metallurgists in his native America and in a wider field. Among the fruits of his research was the production for the first time of commercial quantities of tantalum metal and the related columbium, of which the former has been widely adopted by surgery, in addition to the many uses which it has served in metallurgy and chemistry in recognition of its non-corroding and acid-resistant properties. Its value to the surgeon derives from the fact that it is "biologically acceptable"—there is no antagonism between it and living tissue—so that it is peculiarly suitable for sutures and tubes introduced into the human body and can be fabricated to replace destroyed bone. After two major wars, the numbers who have benefited by Dr. Balke's offering must run into many thousands. That, however, represents only one aspect of his many contributions to the science and technology of metals, ores and metal powders, and his leadership has been fully acknowledged in recent years, by awards of honour, notably by the American Franklin Foundation and in January this year by the Society of Chemical Industry, which conferred on him the Perkin Medal.

Sugar Subsidy Cut

The Government grant to the British Sugar Corporation, which in 1946-47 received £2,749,780—the Corporation budgeted for £3 million in 1947-48—has been reduced to £569,000. In his annual statement, the chairman of the corporation states that the grant (a deficiency payment) was brought down by good weather, absence of the need for rushing through a crop much too large for the present capacity of the factories conveniently to handle, and increased efficiency.

BENEVOLENT SCIENCE

(*Continued from page 140*)

generally in countries outside the temperate zone. Bracken is unaffected permanently, though it can be reduced by an annual application. These new chemicals, moreover, will also kill sugar beet, cabbages, beans and similar useful plants, even if no more than a dust or spray from the main area is wind-borne over them. Whether continued spraying of a given piece of ground will affect its cropping value cannot yet be stated with assurance. Too short a time has elapsed to be sure of this point; but what evidence there is is reassuring. In this department the advances are only of limited usefulness, but they serve as indicators, perhaps no less significant than the early manifestations of radioactivity, to a great field for endeavour from which it would seem nothing but good can come.

ECA Chemicals for Europe

U.S. Policy to Prevent Price Inflation

CHEMICALS, metals and minerals were among the principal items recently allocated to four western European countries and the French zone of Germany by the U.S. Economic Co-operation Administration.

Chemicals for France

France received the largest share of the chemical allocations, a total value of well over $5 million and an allotment of streptomycin accounted for a further $1993. Other items were non-metallic minerals, starch products, non-ferrous metals, Canadian wood pulp and aluminium, Chilean nitrate fertiliser, Norwegian nickel and U.S. petroleum products.

Greece received authorisation for the purchase of ammonium nitrate ($112,038) and petroleum products ($749,957).

At a recent Press conference, Mr. Richard Bissell, assistant deputy E.C.A. administrator, said that if prices became excessively high, America would refuse to sanction the use of ECA funds for inter-European purchases.

Mr. Bissell expressed the hope that "the U.S.A. will not be driven to any kind of specific sanction" to obtain lower European prices, and until ECA's European staff reaches full strength, supervision will be mainly over specific ECA transactions.

He denied that the price question had arisen over purchases of Belgian steel, but added that the problem may appear in the near future, in view of plans for the purchase of Belgian rolling stock for bizonal Germany.

Safeguarding Buyers

Mr. Bissell was questioned also about the matter of "tie-in" scales, whereby essential recovery items are sold on condition that non-essential items also must be purchased. He said that high prices and tie-in sales were a "thoroughly vicious system of trade."

He said ECA must be very careful not to deliver the buyer "bound and gagged into the hands of the seller." If European prices were out of proportion, he explained, some pressure may be put on sellers to remedy the situation. Steel and fertiliser were cited as affording two examples of price problems, with lumber a potential third, where it is available outside Eastern Europe.

Tax on Sponges.—Purchase tax will again be chargeable on unbleached real sponges as from August 9.

BSI and Exports

The Value of Standardisation

THE growing size and influence of the British Standards Institution, and the fact that more and more industries were becoming aware not only of the need for standards, but also of the advantages to themselves in co-operating with the Institution in the preparation of standards on a national scale, were referred to by Lord McGowan in his presidential address to the Institution last week.

He pointed out that standardisation as a means of measuring the properties or assessing the value of goods, was an important element in the proper conduct of industrial and commercial affairs, and in the protection of the health and safety of the public. It was important, too, as a means of establishing satisfactory ranges of types and sizes and where necessary securing interchangeability.

Chemical Standards

Nearly 20 years ago, he said, the chemical industry decided to invite the BSI to extend its activities beyond engineering work, and events had shown the wisdom of this. Much work done by other industries has turned out to be of equal importance to the chemical industry, and conversely, the work under the Chemical Divisional Council of the institution has proved to be of significance to many other branches of commerce.

Stressing the importance of British Standards to the export trades, Lord McGowan recalled that he had asked all Industry Standards Committees of the institution to re-examine their standards from the point of view of exports.

One of the best ways of ensuring that overseas national standards did not conflict with our own, was for the local representatives of British firms to participate directly in their preparation. Many firms which were not formerly interested in export markets were now taking advantage of the help the institution could give them. This included full information on the national standards of the importing countries.

In concusion, Lord McGowan urged everyone concerned with the guidance of industry to participate in the work of the institution and to support it financially, in order that it may retain and improve its existing democratic structure.

An ROF Secret.—Details of what was burning or how the fire started were withheld following an outbreak in a laboratory at the Radway Green Royal Ordnance Factory, near Crewe, on July 21.

Praise From the Chancellor

Tribute to Chemicals and Steel

UNGRUDGING acknowledgement of the improvements achieved in Britain's industrial production was paid by Sir Stafford Cripps when he spoke at a Press conference in Paris on Monday last, following a talk he had had with Mr. Paul Hoffman, head of the Economic Co-operation Administration. He was explaining Britain's attitude to ERP, progress already achieved in European co-operation, and the extent of British recovery over the past 12 months.

"In the 12 months," said Sir Stafford, "the rate of industrial production has increased by about 15 per cent. Manufacturing production is at least 25 per cent above 1938, though we have not yet succeeded in bringing up our coal production to prewar figures." He emphasised that these figures represented quantity and not value.

Unprecedented

Chemicals, engineering products, and steel were being produced at a rate far exceeding anything achieved in this country before. Steel in particular was leading the way with an annual production rate of about 15 million tons a year. The best rate in prewar years was 13 million tons a year.

Dealing with the significance of Britain's production drive to European recovery as a whole, Sir Stafford said: "We shall send 10 million tons of coal to participating countries. This means we shall keep our own people short in order to supply Europe." In addition, Western European countries would receive steel and metal goods and similar commodities at a rate substantially higher than prewar.

The question of nationalising the steel industry, the Chancellor said, had not been raised during the Paris talks, and neither Mr. Hoffman nor anyone else outside Britain was in a position to interfere in British internal affairs.

Austrian Iron and Steel Plan

The Austrian Ministry of Planning has worked out an iron and steel industry production programme which contemplates an annual raw steel output of 1,070,500 metric tons as compared with 650,000 metric tons in 1937. Plans are based on the assumption that ore-production at the famous Erzberg mine in Styria can be increased to about two million tons per annum from its present level of less than one million tons. The bulk of the steel is to be manufactured in Donawitz and Judenburg works of the Alpine Montan group. In order to carry this scheme into effect several special electric furnaces are to be erected at the Donawitz works, the first of these to be ready in 1949.

Former I.G. Farben Unit

$1·5 Million of Dyes for New York

UNDER the authority of the Joint Export Import Agency a contract has been approved between the World Commerce Corporation of New York and Cassella Farbwerke Mainkur of Fechenheim, near Frankfurt, whereby the Cassella firm, formerly a unit of I.G. Farbenindustrie, will manufacture and export to the New York firm dyes valued at $1,543,330. Under terms of the contract the American firm will provide up to $475,000 in raw materials and equipment, and it is anticipated that the contract will not only increase Cassella's production to enable it to fulfil the World Commerce Corporation's order, but to also allow increased deliveries to the German textile trade as well as additional exports.

German economy is expected to benefit to the extent of more than $1 million, which represents the calculated profit to JEIA from the deal. JEIA funds are utilised in the procurement of raw materials for industries in the bizonal area.

TO EXCHANGE CHEMICALS

CHEMICALS figure prominently in the one-year trade agreement recently concluded between Holland and the Soviet zone of Germany. The latter is to deliver 70,000 tons of potassium salts (40 per cent), 2000 tons of magnesium chloride, 500 tons of magnesium sulphate, 200 tons of formaldehyde and 50,000 tons of various unspecified chemical products. The agreement also proposes the delivery of chemical plant and spare parts, scientific apparatus and instruments, and laboratory porcelain. If necessary, Holland will supply the zone with metals for the manufacture of chemical plant and other metal goods specified in the agreement.

Dutch exports will include 70,000 tons of superphosphate (20 per cent), 500 tons of sulphuric acid (66 per cent), gelatine to a value of 600,000 florins, small quantities of oleines, stearine, fatty acids, monochlorbenzol, 500 tons of benzol and 100 tons of nitrobenzol. Other chemical products (valued at 50,000 florins) including pharmaceuticals and caffeine and theobromine (also valued at 50,000 florins) are to be exported from Holland.

Malayan University.—The U.K. Secretary of State for the Colonies has approved the allocation of £1 million from the Colonial Development and Welfare Funds towards the cost of the new University of Malaya. The form of building will be approved by the Colonial University Grants Advisory Committee.

CHEMICAL EXPORTS RISE AGAIN

Marked Increase of Sodium Compounds

SECTION for section, chemical exports in June, recorded in the *Trade and Navigation Accounts of the U.K.* (HMSO, 4s. 6d.), show higher totals than in the preceding month. Chemicals (exclusive of drugs and dyestuffs) achieved their best figure so far this year at £3,893,387 (£3,876,628 in May). Drugs, medicines, etc., advanced from £1,265,840 in May to £1,431,058; dyes and dyestuffs were exported to the value of £751,305 (£654,816 in May); chemical glassware rose from £53,649 to £55,687.

Coal returns show that the £4 million mark has been topped for the first time since the war.

Outstanding among chemicals were the sodium compounds, each of which were exported in considerably larger quantities than formerly. The tonnages of sodium carbonate and caustic, in particular, represented 100 per cent increases.

In the drugs section, the 284,269 oz. of quinine and quinine salts exported, was almost double the quantity for June, 1947, and more than treble the figure for May 1948.

Carbon Black Imports

On the import side of the balance sheet, most items return lower figures, although the few increases, notably of sodium nitrate and carbon black have served to bring the total import values to well over the May total (£2,648,461) to £2,825,749.

Allowing for the rise in prices since 1938, the volume of exports of all types in June is provisionally estimated at 138 per cent of 1938, compared with 134 and 131 in May and April respectively.

CHEMICAL EXPORTS IN JUNE

	June 1948	June 1947
	Cwt.	Cwt.
Formic acid	3,751	1,346
Tartaric acid	405	130
	Tons	Tons
Aluminium oxide	374	16
Sulphate of alumina	4,791	2,253
Ammonium sulphate	23,577	17,108
Ammonium nitrate	2,129	5,934
	Cwt.	Cwt.
Bleaching powder	28,299	34,312
Calcium carbide	2,767	2,009
	Gal.	Gal.
Benzol	9,361	1,648
Cresylic acid	199,510	188,118
Tar oil, creosote, anthracene oil, etc.	2,949,045	3,300,276
	Cwt.	Cwt.
Naphthalene	2,151	1,947
Nitrocellulose	1,348	1,655
Disinfectants, insecticides, weed-killers, etc.	54,545	48,260
	Tons	Tons
Copper sulphate	1,982	2,555
	Cwt.	Cwt.
Glycerine	3,218	3,362
Nickel salts	3,504	10,657
Lead acetate, litharge, red lead, etc.	9,406	5,427
	Tons	Tons
Magnesium compounds	1,049	841
	Cwt.	Cwt.
Potassium compounds	5,548	6,121
	Tons	Tons
Salt	18,616	15,441
	Cwt.	Cwt.
Sodium carbonate, soda ash, etc.	383,354	185,713
Caustic soda	203,753	99,443
Synthetic sodium nitrate ...	20	7,929
Sodium silicate	18,050	4,158
Sodium sulphate	53,519	79,675
Tin oxide	571	806
	Tons	Tons
Zinc oxide	1,060	775
Total value of chemical manufactures, excluding drugs and dyestuffs	£3,893,387	£3,056,900
Quinine and quinine salts ...	Oz. 284,269	Oz. 144,631
Penicillin	Mega units 334,006	Mega units 158,333
Insulin	100 International units 628,783 lb.	100 International units 844,784 lb.
Acetyl-salicylic acid	55,885	91,591
Total value of drugs, medicines and preparations	£1,431,058	£1,177,777
Total value of dyes and dyestuffs ...	£751,305	£624,220
	Cwt.	Cwt.
Chemical glassware	1,016	1,828
Value	£55,687	£38,440
	Tons	Tons
Furnace plant	559	486
Value	£66,344	£67,884
	Tons	Tons
Coal	1,080,172	73,098
Value	£4,040,847	£158,854

CHEMICAL IMPORTS

	Cwt.	Cwt.
Acetic acid	18,895	4,288
Boric acid	6,852	1,000
Tartaric acid	—	1,200
Borax	—	425
Bromine and bromides	—	820
Calcium carbide	23,005	18,302
Coal-tar products (excluding benzol and cresylic acid) ...	14,237	2,254
	Tons	Tons
Ammonium phosphate	—	550
Manufactured fertilisers (including superphosphate of lime, bone-meal, etc.)	1,490	2,816
	Cwt.	Cwt.
Potassium chloride	963,988	704,159
Potassium sulphate	26,630	16,520
Other potassium compounds ...	5,602	1,763
Sodium nitrate	161,738	60,062
Other sodium compounds ...	167,402	75,591
	lb.	lb.
Iodine	220,528	132,301
	Cwt.	Cwt.
Carbon black	92,639	42,486
Total value of chemicals, drugs, dyes and colours	£2,825,749	£2,329,278

Frustrated Enterprise

De La Rue Companies' Experiences

ADDRESSING shareholders at the 51st ordinary general meeting of Thomas De La Rue & Co., Ltd., Mr. B. C. Westall, chairman and managing director, had several interesting observations to offer regarding the company's progress in the production of plastics and gas water-heaters.

Mr. Westall recounted how, in the case of plastics, the opening of the new plant at Tynemouth, operated by De La Rue Insulation, Ltd., had unfortunately coincided with a period of acute shortage of raw materials.

Surprise Tax Move

The production of water-heaters was affected, however, by an entirely different set of circumstances. In this case, the project received Government encouragement and support and the new plant at Gateshead was opened by the Minister of Supply, who congratulated the company upon its enterprise.

"The imposition of the purchase tax in April of last year," said Mr. Westall, "had a most deleterious effect on the Gas Development Company. We engaged in this enterprise to broaden the basis of the company's activities, and we did so with the full encouragement and support of the Government.

"In view of the statements by a responsible Minister of the Crown, nobody, I think, could have foreseen that the Chancellor of the Exchequer would have selected these gas water-heating appliances for the imposition of a purchase tax so crushing as to make it impossible for people of moderate means, let alone the poorest class of society, to purchase an appliance which is the most economic from every point of view for the heating of water.

"In April last the Chancellor increased this crushing tax to 100 per cent, so that the demand for gas water-heaters completely dried up. Now, two and a half months later, he has reduced the tax to 66⅔."

As far as the plastics company was concerned, the chairman said that the various technical difficulties had now been surmounted.

"The immediate future of this company," Mr. Westall continued, "depends to a very considerable extent on the ability of our foreign customers to obtain import licences for the purchase of our material."

The profit of the various De La Rue enterprises last year amounted, before providing for taxation, to £528,815.

It was announced at the meeting that Mr. Sydney Lamert, after completing 25 years as a director of the company, was not offering himself for re-election.

Supplies for NHS

British Drug Houses Expanding

RE-EQUIPMENT and modernisation of the London factory of British Drug Houses, Ltd., was referred to by the chairman, Mr. F. H. Carr when he addressed the recent annual general meeting. The factory, which was still responsible for by far the major part of the company's production, had progressed well, and should be substantially completed in the course of the current year, Mr. Carr said. This would enable the company to play its part fully in supplying the increased quantities of medical and pharmaceutical preparations that the National Health Service seemed likely to bring about.

The additional premises in Kensal-road, now in use, had concentrated in them a large part of the filling and packaging work. The full benefit of the new organisation, however, would be realised only towards the end of this year.

The new factory at Poole, Dorset, for the manufacture of laboratory and industrial fine chemicals, could be considered as having overcome its teething troubles, and it would soon take its place as a valuable producer. Its output had increased steadily during the year and had continued to increase in 1948.

"We have not succeeded in acquiring a suitable site outside London on which ultimately to build a new pharmaceutical works," stated the chairman. "Nevertheless, with the assistance of the Ministry of Town and Country Planning and other Ministries, investigations are proceeding." He emphasised, however, that even if a site were secured, it was likely to be some years before it could be used owing to the restrictions on building and capital expenditure.

ENGLISH FACTORIES IN CANADA

THE increasing readiness of industrial undertakings in the U.K. to establish subsidiaries in Canada was revealed by Mr. Dana Porter, Ontario's Minister of Planning and Development, in London this week. A number of firms in a variety of industries had, he said, expressed their intention of starting subsidiaries in the Dominion, some of them in Ontario. Recent proposals for advancing money in the Dominion on the security of sterling collateral without affecting the exchange rate had also stimulated inquiries from other British firms. Canadians welcomed these inquiries, he said, because they desired to see a better balance between the 1500 branch factories Americans had established in the Dominion and about 100 from the United Kingdom.

BRITISH SCIENTIFIC POLICY

Advisory Council's First Report

THE intensified pursuit of a sound and balanced scientific policy, quicker and more efficient application of the results of fundamental research and a better supply of technologists fitted to apply these results effectively are the main subject matter of the first annual report of the Advisory Council on Scientific Policy, published last week as a White Paper.

Members of the council responsible for this report are as follows: Chairman, Sir Henry Tizard; Sir Edward Appleton, Department of Scientific and Industrial Research; Sir Alan Barlow, H.M. Treasury; Sir Howard Florey, Professor of Pathology, Oxford University; Sir John Fryer, Agricultural Research Council; Sir Claude Gibb, C. A. Parsons & Co.; Sir Edward Mellanby, Medical Research Council; Sir Edward Salisbury, Royal Botanic Gardens, Kew, and the Royal Society; Sir Ewart Smith, Imperial Chemical Industries, Ltd.; Sir Reginald Stradling, Chief Scientific Adviser, Ministry of Works; Prof. A. R. Todd, Professor of Organic Chemistry, Cambridge University; Dr. A. E. Trueman, University Grants Committee; Prof. S. Zuckerman, Professor of Anatomy, Birmingham University. There are three secretaries drawn from the Office of the Lord President of the Council and the Ministry of Defence.

Technical Leadership

Dealing with the country's present economic position, the report states that a return to prosperity can be achieved only if we are able in the future, as in the past, to lead the world not only in the discovery but in the application of scientific knowledge.

"To do so," the report continues, "is far more difficult than formerly, for the economic situation has itself severely limited our capacity to buy from abroad the basic raw materials of industrial production, and we no longer enjoy a super-abundant supply of coal. In consequence, a high level of technical efficiency, as distinct from mere productivity, has become of primary importance; and problems of priority in the allocation of materials in short supply have frequently to be considered.

"Thus to meet the urgent requirements of the economic situation the direction in which scientific research and development should be promoted has itself become a question of fundamental importance which cannot be answered simply from the standpoint of science itself."

The Council believes that its main advisory task is to outline how science can best serve the short-term and long-term interests of the community.

The report suggests that the establishment of a correct balance between these short and long term interests, between the needs of academic and industrial research, and between the requirements of science and government are the major issues to be decided in terms of an overall scientific and economic policy; and there is no doubt that the successful solution of the many problems which now confront this country will in large measure depend upon the right decisions being made.

Science and Government

Describing the increasingly important rôle now being played by science in certain forms of Government administration, the report states that the problem of organisation becomes more complex.

"On the one hand, live research of the highest quality depends on a freedom which is difficult to reconcile with normal conditions of Government work. On the other hand, close contact between the research worker and the user of the results of applied research is essential not only if the results obtained are to be of practical value, but in order to supply a satisfactory foundation and data for the research itself.

"The increasing concern of the civil departments with technical matters as well as the rapid growth in the central government's sphere of activity has inevitably placed upon the Government an increasing responsiblity for the application of scientific research and of scientific principles, which calls for an urgent re-examination of the existing machinery.

"Furthermore, the nationalisation of important sections of industry which depend for their efficiency on the applications of technology throws new responsibilities for scientific guidance and planning on the departments concerned."

Problems of Production

Among the various matters investigated by the council during the past year were building research and development, the coordination of fuel research and the contribution of science to productivity.

Reviewing the work done by a special subcommittee upon scientific stimulation of production, the report states that investigations revealed that the level of productivity in different firms within the same industry sometimes varies by as much as 200 per cent and that there was often no obvious

explanation of this difference. While it was fully realised that general economic conditions, such as inflation, which are often cited by economists as responsible for lower productivity, are extremely difficult to assess, and are quite outside the control of individual firms, these general conditions could not account for differences in the level of productivity between comparable firms.

It was thus clear that the concrete objective of raising the level of the least efficient firms nearer to the level of the most efficient was by itself well worth pursuing, since it would go a long way to effecting the general rise of 10 per cent in overall output for which the Government had asked.

Scientific Manpower

In its study of scientific man-power, the council investigated four primary factors: (i) the number of scientists and technologists already available; (ii) whether the prospective supply of scientists and technologists in the coming decade is likely to meet the prospective demand; (iii) if not, what further steps should be taken to increase the output; and (iv) whether the present distribution of scientific man-power between defence and civil requirements is satisfactory.

Discussions took place with the Ministry of Labour and National Service on the possibility of arriving at a more accurate estimate of the existing number of scientists and technologists and a questionnaire was circulated to all scientists on the wartime Central (Technical and Scientific) Register in addition to others traceable through the universities.

Replies are now being analysed and are expected to provide a useful survey of Britain's existing and prospective scientific manpower.

Shortage of Technologists

On the demand for such manpower, the report is confident that the present output of newly qualified scientists is likely to prove adequate. This relates to "pure" scientists. The position in regard to "applied" scientists is, in the council's view, less reassuring and evidence has been produced from several sources that the effective application of the results of scientific research by qualified technologists and engineers is an even more urgent need than the furtherance of research itself.

Prospects of Improved Coal Supplies

First Report by Statutory Councils

THE chairman of the Industrial Coal Consumers' Council, Sir E. Smith, told a Press conference in London last week that unless the production of silicon bricks for coke-ovens was considerably increased during the next 12 months, a serious position would arise in the steel industry because of the shortage of coke.

The conference marked the presentation of the first of the annual reports by the Coal Consumers' Councils appointed under the Coal Industry Nationalisation Act to watch the interests of consumers. The reports, as a whole manifested the desire that—in the words of the Parliamentary Secretary of the Ministry of Fuel, Mr. A. Robens—in the new set-up of the nationalised industry the consumer should have an avenue of approach to deal not only with complaints but with positive constructive suggestions which will make for better service to consumers generally.

The councils observed in their reports that there should be the earliest possible improvement in quality, no less for industry than for the domestic market. A large part of the coal output was of good quality, but attention had been focused on those qualities where there has been a high increase in ash or in the proportion of small coal. The reason for the poor quality of much of the present day coal was well known. There were heavy arrears in the maintenance of cleaning plants and in the provision of new plants at a time when greater mechanisation underground was increasing considerably the amount of coal needing to be cleaned.

The Industrial Council points out that in the industrial field it may prove to be better to continue to use a proportion of untreated small coal—if the price is right—rather than to install cleaning plants to treat every ton of coal produced. Firms planning new coal consuming plant are urged to bear this in mind and consult the NCB on the availability of particular types of fuel before contracting for new equipment.

Both the councils—the Domestic and Industrial Consumers—considered that the high prices of coal and coke reflected the costs of improving both the physical conditions at the pits and the status of the miner, and hoped that these improvements would be rewarded by an increase in the output of cleaner and cheaper coal.

The councils agree that the whole price structure needs to be reviewed and they are keeping closely in touch with the board in the preparation of a new and rational structure. The principal groups of organised consumers were being consulted in this matter.

NCB's PROFITABLE BY-PRODUCTS

Close Integration with Iron, Steel and Chemicals

A MARKED contrast between the heavy loss on coal marketing and trading and the profitableness of the coal by-products industries was a significant feature emerging from the recent publication of the first annual report and accounts of the National Coal Board. A profit of £147,207 resulted from the sale of the chief secondary by-products of coal, and £925,555 from the sale of coke. The only working manufactured fuel plant vested in the Board showed a profit of £57,996. Almost all the briquetting plants were profitably operated, the total profit from this source amounting to £228,409.

The report revealed that the NCB operates 55 coking plants, most of which are in the Northern, North-Eastern and South-Western Divisions, where most of the country's coking coal is found. They produce more than two-fifths of the national output of "hard" coke. Soon after the vesting date, states the report, the Board started a thorough survey of all these plants. This survey was still being carried out at the end of the year, but enough information had been received to show that many of the ovens would have to be replaced or thoroughly repaired. The Board inherited many of the country's oldest coke ovens; for example, one plant at Bankfoot (Northern Division), consisted of 26 Simon-Carves French ovens built in 1882—still in relatively good condition and producing a special low ash coke.

Carbonisation Control

The Board has appointed a director of carbonisation in charge of a carbonisation and briquetting branch. He is responsible both to the production and marketing members of the Board, and carbonisation officers have been appointed in each division. The control of coke supplies is still in the hands of the Ministry of Fuel and Power's Coke Directorate, and the Board's marketing officers carry out the general policy laid down by the Ministry.

Throughout the year, the report continues, the demand for coke exceeded the supply. The urgent need for more steel caused an increased demand from the biggest consumers of coke—the iron and steel industries. By the end of the year the supply of coke to blast furnaces was much improved, but supplies to foundries and other consumers were still short.

Hard coke for blast furnaces and foundries is likely to remain scarce so long as the steel industry aims at producing an annual output of anything more than 14 million ingot tons of steel—until more and better coke ovens can be built. Towards the end of the year, however, when hard coke was particularly needed by the iron and steel industry, the gas industry supplied gas coke to some consumers who had previously been receiving hard coke, thus releasing more hard coke for the blast furnaces.

Exports of coke during the year were negligible, but the Board look forward to the time when the important overseas markets, particularly in Scandinavia, built up by the former owners of the coking plants take British coke once again.

Coke: Sources and Costs

The iron and steel industry, like the Board's coke ovens, produces about two-fifths of the national output of hard coke, leaving only a fifth in the hands of independent undertakings. In order to co-operate with the other coke producers, the Board has joined the British Coking Industry Association. Apart from establishing a means for discussion on matters of common interest, this association provides part of the funds of the British Coke Research Association (the rest of the funds being found by the Department of Industrial and Scientific Research). During the year three representatives of the NCB joined a team of six technicians sent by the British Coke Research Association to America to investigate coking practice and research there.

The Board is concerned about the high cost of new carbonisation plant and the delay in obtaining constructional materials. The capital costs of building new coking plants have trebled since 1939. Under present-day conditions it takes about four years to build a coke oven carbonising 7000 tons a week. The main cause of delay is the shortage of refractory materials.

It is stated in the report that the Board produces large amounts of by-products from coking plants—for example, about a sixth of the tar, a third of the benzol and a fifth of the sulphate of ammonia produced in the U.K. Derivatives of tar and benzol provide in turn important raw materials for the chemical, pharmaceutical, plastics, paint and dye industries, while sulphate of ammonia is much in demand as a fertiliser. The coke ovens also produce about 8 per cent of the country's town gas.

Also nationalised are tar distillation plants at Caerphilly, Dumbreck, Thrislington, Bankfoot, Tudhoe and Lambton,

Crigglestone, Dalton Main, Old Silkstone and Harworth. The plant at Caerphilly is a modern pipe-still installation which handled 33,000 tons of tar during 1947.

This tar came not only from coke ovens belonging to the Board but also from privately-owned ovens and from various gas works in South Wales. Products from these plants include pitch, tar oil, road tar, tar fuel oil and naphthalene.

During 1947, there were produced about 24 million gal. of crude benzol, some four-fifths of which was refined at NCB establishments. From the crude benzol the Board produced motor benzol, toluol, xylol and naphthas. It disposed of most of its benzol to the National Benzole Company, an organisation created by the British producers of benzol, which has co-operated with the Government since the beginning of the war through the Petroleum Board.

Most of the output of sulphate of ammonia was marketed during the year through the Sulphate of Ammonia Federation. The demand for this product is particularly keen and, in view of the Government's drive to increase agricultural output, is likely to become keener.

In addition to the production from tar and benzol of important raw materials for industry, the Board also manufactures proprietary articles such as liquid waterproofers and adhesives ("Synthaprufe"), rust-resisting paint ("Presomet") and wood preservatives ("Presotim"). It is carrying out a complete survey of all by-ducts with a view to development.

Manufactured Fuels

The Board operates 30 coal briquetting and manufactured fuel plants, 10 of which were purchased during the year from the Ministry of Fuel and Power for £50,000. Production in 1947 amounted to 703,711 tons of briquettes and 851,776 tons of ovoids.

Some of these plants—particularly in South Wales—make high grade briquettes which find a ready market both at home and abroad for firing locomotives and for industrial uses. The "Phurnacite" plant in South Wales manufactures a special type of carbonised ovoid. Production is to be developed.

On the subject of science, the report acknowledges that physics, chemistry and geology find daily application in the winning and utilisation of coal. In preparing to take over the industry, the Board planned to apply scientific method and scientific knowledge freely and widely—underground, at the coal face, on the colliery surface, in coal preparation, and in the coke ovens and by-products plants. In each division a chief scientist was appointed to be responsible for the day-to-day scientific activities of the division and to be the scientific adviser to the Divisional Board.

It is asserted that before nationalisation, only a few colliery companies were properly equipped for day-to-day scientific control; still fewer were equipped to conduct research. Some, however, had good scientific organisations and the staffs and laboratories taken over from them formed a nucleus for the development of the Board's scientific activities. Some research was also being conducted on behalf of the colliery owners by the British Colliery Owners' Research Association. "Even so," it is alleged, "the scientific inheritance of the Board was meagre."

During 1947, the Board's scientific organisation was being built up; some laboratories and equipment were acquired and some staff were recruited; but shortage of scientists, laboratories and equipment set a limit to what could be achieved during the year. Priority was given to the setting up of an organisation which would provide a day-to-day scientific control service covering the whole range of the industry's activities.

Research

Scientific research in the coal industry is of three main kinds, *viz.*: laboratory research on physical and chemical problems arising out of coalmining and coal utilisation; technical research leading to the development of new instruments, methods, processes and products; and research on problems of health and welfare.

Much of the work will continue to be carried out by other bodies, for example, universities, hospitals and co-operative research associations. The work done by the Board will be mainly concentrated in a single research establishment. A site for this establishment was found in 1947 but was not acquired until 1948. The small research staff, which departed little from inherited lines of work, consisted mainly of teams taken over with their laboratories and equipment from the British Colliery Owners' Research Association and one large colliery company.

Fundamental laboratory work carried out by the Board in 1947 was concerned mainly with dust and illumination in coal mines. An apparatus was needed for the rapid measurement of dust concentrations in mine air to avoid recourse to laboratory analysis, which could never be completely satisfactory because of the time lag between taking a sample and analysing it. A simple apparatus was produced and was undergoing trials at the end of the year. With this it will be possible to make a rapid survey of the comparative dustiness of the pits throughout the country.

TOO MUCH FERTILISER

Italian Manufacturers Resort to Propaganda

ITALIAN chemical industry since the war has presented the phenomenon, highly unusual in most other parts of the world, of over-production of fertilisers. The state of unbalance in Italy, however, could more correctly be attributed to under consumption.

During 1945 the consumption of hyperphosphates fell to 10 per cent of the pre-war level. In 1946, however, it rose to 40 per cent and reached the 70 per cent level in 1947. During the same period the consumption of nitrogen fertilisers rose from 10 to 60 per cent.

Since production reached 85 per cent of the pre-war figure by the end of 1947, it is clear that over-production has occurred, and that stocks are accumulating.

This is not a desirable situation. The soil of Italy, impoverished during the war years, ought now to receive greater supplies of fertilisers than before the war. This is the argument being put forward by fertiliser manufacturers, who are capable of producing about twice the amount taken up by farmers.

Prices Cut

In order to induce farmers to use more chemical fertilisers, prices are being reduced in the early part of the season, and gradually increased as the season advances. The reductions will commence with the forthcoming agricultural campaign. For instance, a farmer who buys calcium nitrate (at present sold at 37,500 lire per ton) at the beginning of the season, will pay only 33,500 lire. As the season progresses the price will increase until it reaches a maximum of 35,500 lire.

Ammonium nitrate, hitherto costing 72,200 lire a ton, may be obtained at 54,200 early in the season. Later it will have risen to 60,200 lire. A 2½ per cent discount will be allowed on phosphatic fertilisers purchased in July. In August the discount will be reduced to 1½ per cent.

The aim of the scheme is two-fold. It will (1) induce many farmers to purchase more fertilisers; and (2) it will lessen the peak demand for railway cars. It is expected that as the prices of fertilisers are reduced, farmers will be paid more for their corn, thus encouraging them to use more fertiliser.

Uneconomic Production

In spite of the subsidies recently given to the Italian sulphur industry, a crisis continues. From August 1, 1947, to June 15 this year, 160,000 tons of sulphur were produced in Italy, including 90,000 in Sicily. About 70,000 tons were exported, mostly to France. Orders from abroad are generally few, owing to competitive prices asked by U.S. exporters. There are, however, no immediate prospects of reducing the price of Italian sulphur. Even the introduction of more efficient U.S. machinery would not help much, for the geological formation of Italian soil does not lend itself to such machinery.

The other great problem is the superfluous labour, which the sulphur industry in common with other industries is not allowed to dismiss for fear of social unrest. Thus the industry is overcrowded with personnel, and the output per head suffers.

NCB's PROFITABLE BY-PRODUCTS

Work on the effect of mechanised processes on dustiness in mines was continued. New devices for dust suppression were tested. Water is often used to suppress dust at the coalface, but in some mines too much water may damage the roadways and make it harder to clean the coal. Experiments were conducted with various kinds of foam and with special wetting agents.

When the central research establishment is set up priority is to be given to the laboratory study of: (1) New methods of sampling and size analysis of mine dusts and investigations into their nature and formation; (2) new instruments for use in the industry, especially new automatic detectors—and if possible continuous recorders—of the noxious gases, carbon monoxide and methane; and (3) surface properties of coal, a better knowledge of which will contribute to improvements in dust suppression, coal preparation, briquetting and carbonisation.

During the year several new processes for the manufacture of briquettes were investigated. One process would enable carbonised briquettes to be manufactured from "caking" coals. Another would enable large briquettes to be made in a double roll press. A new process based on the principle of "pneumatic froth flotation" was developed for the cleaning of fine dirty coal and slurry which can be burnt is recovered from washery effluents by adding flocculating agents.

Wider Use of Radioisotopes

U.S. Commission Facilitates Commercial Preparation

A SCHEME to facilitate the production and distribution of certain chemicals containing radioactive elements, for the purposes of research and medical and industrial use, has been drawn up by the U.S. atomic Energy Commission.

For the past two years research workers have been able to get radioisotopes from the Oak Ridge National Laboratory, Tennessee, but if they wished to use the materials in other than their original form they have had to synthesise or manufacture the compounds in small lots in their own laboratories. This proved to be an inconvenient and expensive method and it is now expected that the wider availability of such products will facilitate research work in many scientific fields.

Commercial Production

In future, commercial firms will be encouraged to manufacture and sell specially selected compounds, each being labelled as such, and the radioactive materials will be supplied by the Atomic Energy Commission. This is in accordance with the commission's announced policy of encouraging private industry to develop the use of radioactive materials.

Certain other compounds, for which commercial production facilities do not exist, will be produced in the commission's laboratories for general distribution. It is hoped, however, that private production will increase to such an extent that the commission will ultimately be able to withdraw from the manufacture of these materials. The price to be charged for " isotope-labelled " compounds, produced by commercial firms, will be fixed by the firms themselves.

At present, radioisotopes are sold through a special division of the A.E.C. at a price set to cover the costs of final fabrication. This price does not include, for example, the cost of meeting the initial expenditure incurred in laboratory equipment and nuclear reactors, which are used for research purposes other than radioisotope production. Consequently, the present pricing policy results in a subsidy of research in which radioisotopes are used, and if production develops on a commercial scale it may be necessary to re-examine the pricing policy.

The saving which could be effected by volume production is illustrated by the cost to a primary user of one millicurie of ethyl iodide containing carbon 14. The synthesis of a ten-millicurie lot could be done at little more than the cost of one millicurie.

Inventions or discoveries made by persons using radioactive isotopes, or using or manufacturing isotope-labelled compounds, will be subject to patenting by the inventor in accordance with normal industrial practice. The commission does not contemplate the reservation of patent rights to inventions and discoveries made by recipients of radioactive materials under the new distribution scheme.

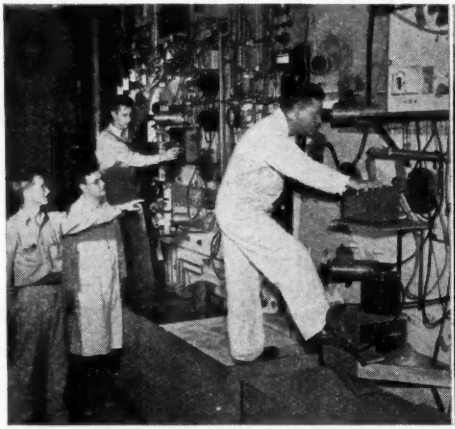
Users of radioactive isotopes or isotope-labelled compounds will be required to meet the safety and health standards established from time to time by the commission and they will also have to publish reports on significant results of investigations involving the use of radioactive materials. The regulations governing these reports, however, will be applied so as not to interfere with an inventor's opportunity to obtain patent protection for his inventions and discoveries.

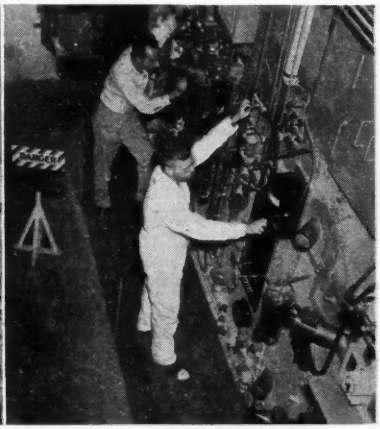
Radio chemicals are, of course, still subject to restrictions. They may not be used indiscriminately, but, as they become increasingly plentiful, there is little doubt they will be made generally available for analysis, and identification in industry, making many processes much simpler and affording a means of doing things for which there is as yet no possible procedure by conventional processes.

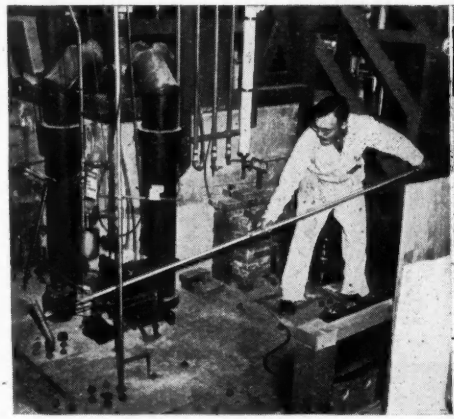
Distribution for Industry

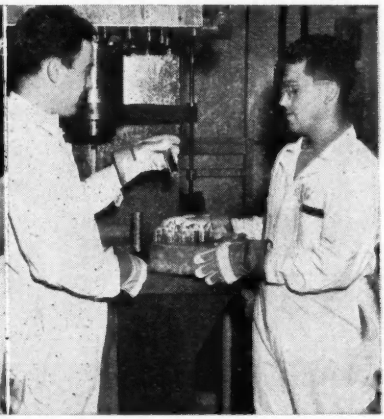
In anticipation of that event, one U.S. commercial laboratory, Tracerlab, Inc., has set up in Boston an organisation equipped to provide a great variety of these radiochemicals for industry and is already supplying to the permitted users, hospitals, universities and research groups, etc., compounds of radioactive carbon 14.

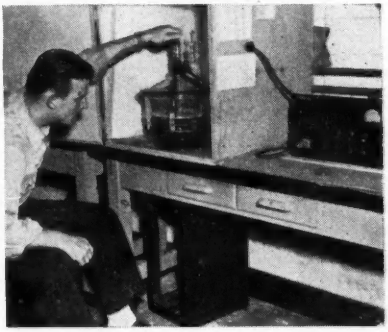
Soon, it is anticipated, this organisation with which several specialists of the Massachusetts Institute of Technology are associated, will be supplying, among others, radioactive compounds of barium chloride, sodium cyanide, acetylene, methyl alcohol and methyl iodide. Many others, including acetic acid, acetyl chloride, ethyl acetate and ethyl alcohol compounds now issued under AEC authorisation will be distributed. However, as the production of radioisotopes increases, the restriction will end, and several other undertakings are now being set up with special equipment to process " stock " radiochemicals to special requirements.











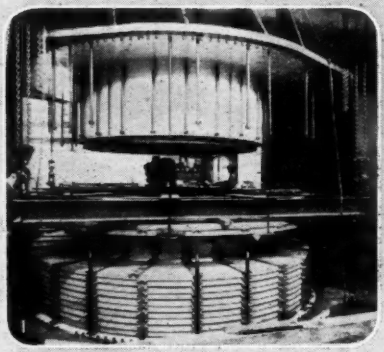
RADIOCHEMICALS IN THE U.S.A.

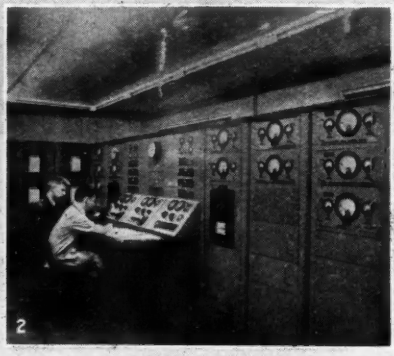
Shown here are some phases in the work of the U.S.A.'s National Laboratory, Oak Ridge, Tennessee, by which increasing supplies of radioisotopes have been made available for research. Top, left: Observing the initial dissolving process from behind 2 ft. of concrete and lead. Right: Two operating chemists at controls and periscopes, viewing the separation of dangerous radioactive products

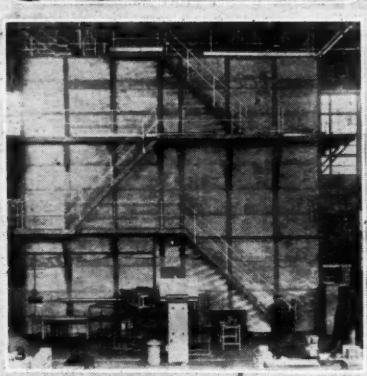
Centre, left: Introducing radioactive material through the roof of a special cubicle to the chemical processing units below. Right: $Ca(NO_3)_2$ is "canned" before bombardment in the pile

On the right, L. D. Norris adjusts the apparatus, which he perfected, for measuring the natural disintegration of carbon 14

Vast Tools of British Atomic Research







AT HARWELL

Representing the first visual evidence of what is being achieved at Britain's primary atomic energy research station, these pictures show: (1) Cyclotron magnet during erection. (2) Control room of Gleep (low energy pile). (3) General view of one face of Gleep. (4) Pit for frequency modulated cyclotron. (5) Extracting radioactive isotopes after irradiation in the Gleep

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Chemists and Trade Unions

"Weakening of Professional Status"

IN a recent address to members of the Engineers' Club in Manchester, Mr. H. L. Howard, Hon. Registrar to the British Association of Chemists, spoke of the growing tendency, even among individuals of a professonal standing, to join trade unions specific to their industry rather than those catering for the profession they practised. Teachers of chemistry, he said, tended to join the National Union of Teachers, and chemists employed by railway undertakings to join the Railway Clerks' Association.

Chemists as a professional group therefore tended to become uncoordinated; they would lose their professional status and allow their interests to be merged with the more numerous non-scientific staffs of their industry. Of the 30,000 chemists in the country, fully 20,000 were members neither of the Royal Institute of Chemistry nor the British Asociation of Chemists.

The BAC, Mr. Howard continued, is the only trade union catering exclusively for chemists and he considered it was the duty of all chemists to protect their economic interests by supporting it—irrespective of any other bodies in which they might feel interested.

"Closed Shop" Fears

In his opinion, the first step should be to approach the universities. The register of student members in Manchester could be increased a hundred-fold. It was the fear of the "closed-shop" principle which normally forced chemists into the non-technical unions and students could be protected from this weakening of their professional status if they were urged to join the BAC before entering industry.

For recruitment along these lines Mr. Howard was a firm believer in the personal approach and urged again that every section committee of the BAC should nominate and widely advertise the fact that one or more senior members would personally undertake to look after the interests of student members of the section.

Exhibition of Scottish Industry

Plans for a Scottish Industries Exhibition to be staged in the Kelvin Hall, Glasgow, in the autumn of 1949 were announced last week by Sir Steven Bilsland, chairman of the executive committee of the Scottish Council (Development and Industry).

The exhibition will show the rapid development of existing Scottish industries since the war, and demonstrate the large number of new industries established in the country during the past 10 years.

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German Assets In Italy

Shares Offered in Electrical Carbon Co.

INFORMATION has now been received from Italy, states the *Board of Trade Journal*, that 60,368 shares (of a total of 80,000) in the following former German-owned company are to be offered for sale: Societa Italiana Dei Forni Elettrici E Dell' Elettrocarbonium, Via G. Verdi 6, Milan.

The company was registered in 1897, has an office in Rome with a sales office in Milan and representatives in various Italian towns. Employees now number about 900, of which 90 are office staff. The factories at Narni and Ascoli Piceno produce carbon-anodes and various other articles manufactured on the basis of carbon required for electric, electro-technic and chemical appliances (carbon-rods, carbon for cinema, carbon for the reproduction of designs, carbon for photographic reproductions, electric motor brushes, automobile and motor cycle brushes, carbon for cells and telephony, carbon contacts for lifts and carbon strips for cranes and trolleybuses, carbon for electric soldering, etc.)

Further particulars (translated into English) regarding the company as detailed in the "Notice of Sale" published by the Agency of the Italian Government, are available for inspection at the Export Promotion Department of the Board of Trade, Thames House North, Millbank, London, S.W.1. ((E.P.D. Ref. C465/48).

Radioactivity Lectures

POST-GRADUATE lectures on "The Impact of Radioactivity on Inorganic Chemistry" will be given by Professor H. J. Emeléus at the Royal Institution, Albemarle Street, W.1., on September 30, and October 7 and 14 at 6.30 p.m.

The lectures have been arranged by the London Section of the Oil and Colour Chemists' Association, members of which will be admitted only by ticket. These will cost 10s., and will cover the three lectures. Visitors will be allowed (at the same charge), while junior members may obtain complimentary tickets. Application should be sent to Mr. H. C. Wordsall, hon. secretary of the London Section of O.C.C.A., c/o Plastanol, Ltd., Crabtree Manorway, Belvedere, Kent.

The syllabus is as follows: Lecture 1—The Chemistry of Radioactive Substances; Lecture 2—The Experimental Study of Radioactive Substances; Lecture 3—Some Applications of Radioactive Substances.

Science Provided the Torches

Fuel Research Station's Aid for the Olympiad

A NOTICE from the fuel Research Station, DSIR, discloses that that organisation has made an important though not a spectacular contribution to the preliminary arrangements of the Olympic Games. It advised on the design of torches carried across Europe from Greece, and on the most suitable fuel.

In December 1946 the Fuel Research Station was approached by Mr. E. J. Holt, of the Organising Committee of the XIVth Olympiad, for assistance and advice. It was essential that the torch should be of light weight as it had to be carried for about 15 minutes by each runner (about 1600 runners would be required on the route across Europe), and the torch would require to be so constructed that the fuel would burn under the most difficult weather conditions.

The fuel employed had to be easy to ignite, at the same time involving no high fire risk, as the torches would have to be transported and stored at numerous places on the route some time before the commencement of the run. It was also necessary, to ensure that each new torch could be lit easily and with certainty from a preceding torch; it was also desired that the fuel should give a visible but not very smoky flame.

This problem was undertaken by the Fuel Research Station and the actual investigation was carried out by Dr. L. R. B. Shackleton. It was decided that the most suitable fuel was hexamine in the form of tablets. Hexamine gives a non-luminous flame, and to make the flame visible in all weathers 6 per cent of naphthalene was added.

Prototype torches made at the Fuel Research Station were tried out by runners, and finally submitted to Commander F. W. Collins, R.N. (Retd.) who was responsible for the manufacture and distribution of the torches, and for the run across Europe.

In the final design of the torch, seven tablets were enclosed in a perforated metal cylinder with an inner sleeve concealing the lower three tablets. As the upper tablets burned away, the lower reserves were forced up into the burning zone by a spring. In order to facilitate lighting, a tablet of nitrate composition was introduced on top of the fuel pack. A quick match, provided for ignition, protruded through the perforated container.

One or two final refinements were introduced at the concluding stages to safeguard the effectiveness of the torches during transport to the various countries through which the relay runners had to pass. The fuel tablets were totally enclosed in a nitrocellulose cover which burned immediately on ignition, leaving no carbon residue. The perforated metal fuel container was also capped and sealed with adhesive tape. Both of these precautions were considered necessary to preserve the fuel and to avoid any risks of accidental ignition.

Midlands Programme to Increase Power Supplies

THE industrial potential of the Midlands will be considerably increased when the present electricity generating plant extensions there have been completed. The estimated cost is £20 millions. The programme provides for an additional output of 500,000 kW at six stations by 1950. This year the increase is expected to amount to about 200,000 kW, with a similar increase next year.

Work at present in hand or projected, includes:—

Hams Hall, Birmingham—two 50,000 kW sets will be commissioned this year, and another early next year.

Ocker Hill, South Staffs.—One 30,000 kW set is already in commission, and another is expected to be ready by December.

Meaford, North Staffs.—Three 30,000 kW sets are already operating, and a second may be operating by the end of the year.

Walsall.—One 30,000 kW set is scheduled to commence operations at the end of the year, and three more twelve months later.

Stourport, Worcs.—Work proceeds at a 60,000 kW set which may be commissioned next year.

Nechells, Birmingham.—By 1950 an obsolete plant will be replaced by two 50,000 kW sets.

Electricity Load Spreading

The first meeting of the Central Committee on Electricity load-spreading in commerce, the formation of which was announced by Mr. Alfred Robens, Parliamentary Secretary, Ministry of Fuel and Power, on June 27, was held at the Ministry of Fuel and Power last week.

Representatives of commercial organisations and trades unions discussed with officials and representatives of all Regional Boards for Industry the outlines of the methods by which non-industrial establishments can help reduce consumption.

A TRIUMPH FOR ENGINEERS

British Chemical Firm's New Titanium Plant

A SYMMETRICAL group of factory buildings resting upon 3200 concrete piles driven some 30 ft. into Grimsby's marshland; a specially built "pier" 1000 yards long to facilitate the discharge of effluent far out into the River Humber; three boreholes each capable of delivering 40,000 gallons of water an hour.

These were features which a party of trade and technical journalists found specially interesting in the course of a visit last week to the titanium pigment plant now being constructed at the Pyewipe Industrial Estate, Grimsby, by the British Titan Products Co., Ltd.

The company has operated a similar plant at Billingham since 1934 and the Grimsby project is the result of a decision made in 1943, when the firm realised that considerably extended production capacity would be required immediately war was ended. It was not until early 1946, however, that Government formalities were completed and permission was granted to start construction.

The foundation stones were laid on the 55-acre site in May that year and the factory is planned to be completed before the end of 1948. Production is expected to begin early next year.

More than £1¼ million has been expended on the site and when the plant is in full operation, approximately next June, output of 10,000 tons of the latest rutile grade of titanium oxide pigment is expected.

Less than half the total acreage has been occupied and ample space remains for further expansion later.

Self-Contained Unit

At the Billingham factory, sulphuric acid and essential services are purchased from the neighbouring plant of I.C.I., Ltd. The Grimsby works will be entirely self-supporting, apart from the use of grid-power. In accordance with this policy, a contact sulphuric-acid plant producing 110 tons of sulphuric acid daily, is being erected alongside the titanium plant. This will be the largest single contact unit in the country.

Factors influencing the choice of the Grimsby location included the excellent water supply, the convenient chalk and limestone deposits and the close proximity of the two seaports, Grimsby and Immingham, for imports of the main raw materials, American rock sulphur and Norwegian ilmenite ore. Immingham is likely to be the main port for the works, as Grimsby does not possess handling facilities of the type required to deal with these materials.

In addition to receiving advantages the firm will also bestow them, for the establishment of a new industry at Grimsby will relieve to a certain extent the town's dependence upon the fishing industry for its prosperity.

Good Staff Work

The project, in many ways, represents a personal achievement of Mr. F. Carter, the chief engineer of the company, who was primarily responsible for designing the plant. Although certain work has been carried out by sub-contractors, construction, in the main, has been planned and supervised by British Titan staff and no outside architectural assistance was called upon.

Examples of British engineering skill, resource and determination of an exceptionally high order were revealed as company officials recounted some of the difficulties which had to be overcome, such as when driving the piles for the buildings on the perimeter of the plant, they unwittingly created a hard "core" of ground in the centre of the site. The sinking of piles for the inner buildings "presented something of a nightmare."

There were also incidents during the recent Lincolnshire gales, which tore the pier pile-driving craft from their moorings and presented the firm's engineers with unusual anchorage problems.

The tour of the plant was made in small groups, the visitors being shown first the ilmenite and sulphur storage silos, the ball mill for grinding before processing and the digestion, dissolution and reduction processes by the intake of steam, air and water.

Much interest was aroused by the use made of rubber linings in the various concrete liquor tanks. Because of lead shortage, the vessels are being given a rubber lining which, in turn, is covered by a brick-tile casing, affording double protection

After inspecting the liquor clarification and filtration apparatus, the visitors were shown the rotary filters, incorporating a highly effective system for waste liquor recovery.

Defeating Lead Shortage

Several members of the party emulated the vigorous enthusiasm of their guides by climbing, somewhat precariously, into the huge Dorr thickeners built of concrete and 60 ft. in dia., the largest domed tanks of their kind. Here the liquor is settled and a rotating rake scoops the filtrate into a

channel from which it is pumped clear. The floors and walls of these tanks are also rubber-lined and represent very successful engineering on the part of the technical staff.

The plant tour concluded with a brief inspection of the rotary calciner house and the electrostatic precipitation equipment which, with the cooling, milling and surface treatment processes, produce the actual titanium oxide pigment in its marketable form.

Although some of the machinery is still incompletely housed and much work remains to be done before production starts, the whole gives a clear impression of a well-designed and compact unit.

British Throughout

At the luncheon reception in the works canteen, Mr. H. S. Tasker, the company chairman, welcoming the Press party, took the opportunity of correcting statements which he said had been made, regarding the structure of the company. The firm, he said, originated in the early '30's, sponsored by I.C.I., Ltd., the Imperial Smelting Corporation, Goodlass Wall & Co., Ltd., and the National Lead Company of America. A factory was erected at Billingham in 1933 and production began a year later.

The participation of the National Lead Company was not approved by the Anti-Trust Department in the U.S.A. and finally the American company was obliged to dispose of its interests.

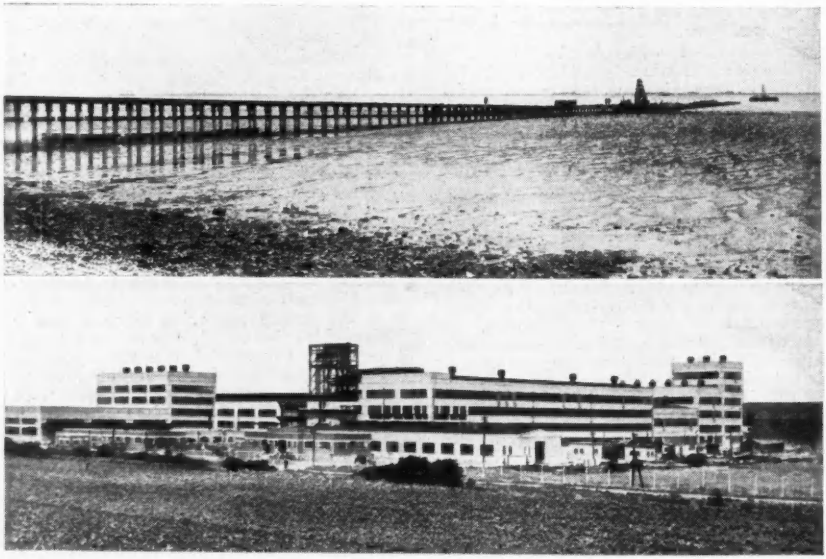
To-day, British Titan Products was in every sense, British. The controlling interests were now divided upon the basis of 30 per cent held by each of the other three original sponsors and the remaining 10 per cent by R. W. Greeff & Company.

There would probably be an increase in share capital as soon as possible in order to provide for future development.

Full of Plans

Mr. Tasker emphasised that the progress made by the firm in the production of titanium pigment was not to be confined exclusively to this country. A factory was being built in "almost virgin bush country" in Tasmania and in an area where few industrial facilities existed. The firm was interested in a similar project in India. These were extra tasks shouldered by the firm's technicians and being dealt with at the same time as the Grimsby development.

"We are full of plans," the chairman declared, "but it is the most difficult thing in the world to estimate future trends when one considers the conditions existing in this



The effluent disposal jetty stretching out into the Humber, and (bottom) a general view of the Grimsby plant

country during the past few years." He felt sure, however, that the new plant would not only meet domestic demands but produce a certain amount for export.

Potential Expansion

British consumption of titanium was still well below that of America and he believed there was adequate scope for developing the market here.

The total labour force at Pyewipe would probably be in the region of about 300. Prospective employees were undergoing training in small batches at the Billingham factory ready for the opening of the Grimsby plant.

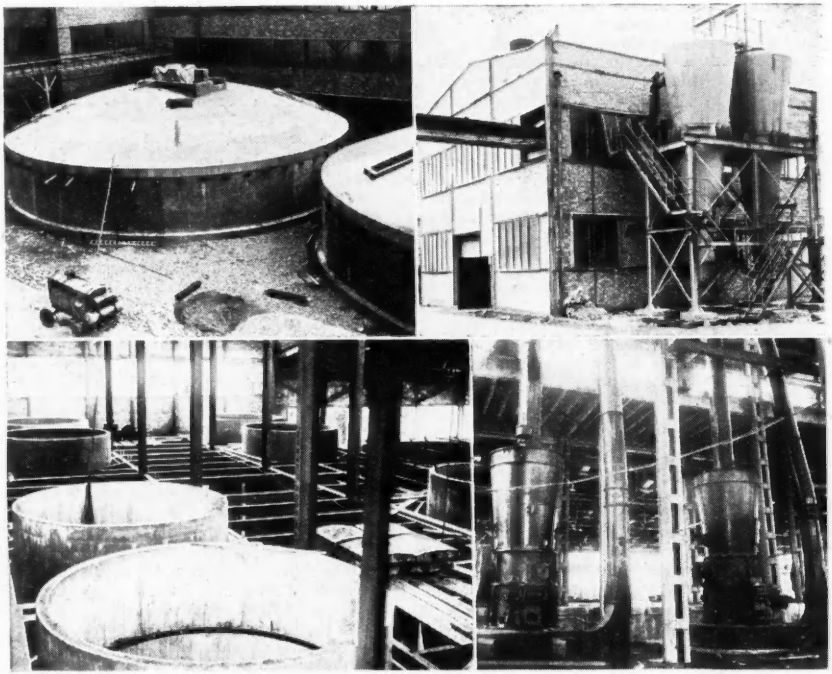
The anticipated total production from the two factories during 1949 would be 22,000 tons; Grimsby contributing 10,000 tons of the latest rutile grade of pigment and the Billingham plant 12,000 tons of the anatase type. At present the paint trade consumed more than half the company's output.

The research and technical departments would be retained at Billingham, and an administrative unit was likely to be built mid-way between the two production centres.

After luncheon the guests were taken by motor launches to visit the pile-driving ship at the head of the effluent disposal jetty in the Humber, before returning to London by the afternoon train.

In addition to Mr. Tasker, other prominent officials of British Titan Products who received the Press party were Messrs. C. J. Stopford (managing director); F. Carter (chief engineer); G. T. Tinsley (development manager); W. A. Cash (assistant managing director); J. A. Irvine (office manager, Grimsby), and E. C. Seaman (resident engineer).

In charge of all the excellent arrangements connected with the reception and entertainment of the visitors was Mr. I. F. F. McIntyre (general sales manager).



Top: The vast domed thickeners and (right) raw water treatment plant
Bottom: Digesters and (right) pigment grinding mills

American Chemical Notebook

From Our New York Correspondent

A NEW chemical firm, the Phillips Chemical Company, a subsidiary of the Phillips Petroleum Company—whose name has been associated with the proposed English production of carbon black—has been established by the parent company to carry on its chemical and synthetic rubber operations, in addition to its furnace-type carbon black operations which are at present controlled by Philtex Chemical Company, another subsidiary. The establishment of the new unit is expected to expand the firm's chemical operations to a considerable extent, particularly in the fertiliser field. Under the new programme, Phillips Chemical has taken out a long term lease on Army's Cactus Ordnance Works at Etter, Texas, where it will build a new ammonium nitrate plant. The former ordnance installation is one of the largest ammonia plants in the world and will be used to produce ammonia nitrogenous fertilisers. The company has announced that it will increase the plant's present anhydrous ammonia capacity of 70,000 tons a year to more than 140,000 tons.

* * *

During 1947, the U.S. salt industry produced a record output of 16,138,374 tons compared with the previous year's total of 15,132,145 tons. This increase is attributed mainly to the growing demand for salt by the American chemical industry. The output of brine salt was 9 per cent higher than in 1946 and rock salt also showed a 10 per cent rise. Evaporated salt, on the other hand, declined by 3 per cent. The most notable increases in salt consumption were in soda ash and chlorine production—increases of more than half a million tons for the former and more than 240,000 tons for the latter. In 1947, salt used for chlorine, bleaches, chlorates, etc., totalled 368,430 tons (evaporated), 711,439 tons (rock), and 1,661,943 tons (brine). Salt used for soda ash totalled 7,467,138 short tons (brine) and for dyes and organic chemicals 59,683 tons (evaporated), and 67,100 tons (rock).

* * *

The Wheatland Tube Company, manufacturers of tubular products, and the Wheatland Steel Products Company, producers of steel pipe couplings, of Wheatland, Pennsylvania, have formed the Maneely Chemical Company, which is now constructing a $500,000 plant to utilise a new process whereby spent pickling liquors will be converted to pigments. The new plant is expected to be placed in operation late this year when wastes from the two mills will be treated in accordance with the requirements of the anti-river pollution authorities. The company plans to offer waste treatment services to other manufacturers having similar problems. The waste liquors from the Wheatland mills will be treated by reacting them with zinc wastes from the galvanising departments to produce ferric hydrate and the sulphate and chloride of zinc. Saleable materials will be made from waste acid liquors and low value zinc by-products. The process converts the ferric hydrate into a raw material for the manufacture of yellow and red iron pigments or abrasives used in paint and ink trades and can be used for polishing glass surfaces; purifying manufactured gas; and preparing ferric sulphate or ferric chloride for sewage treatment.

* * *

The use of Vinosols, claimed to be the most economical and durable of the vinyl resin coatings, is expected to be significantly increased through the development of a new practical fusion oven for use in curing Vinosol coatings. The new oven is the result of combined research and development by American Resinous Chemicals Corporation and Gehnrich & Gehnrich, Inc., whose chemists and engineers have been at work on the project for several years. Hitherto, lack of adequate fusing equipment has discouraged the use of Vinosols. A standard convection unit has been developed, having overall dimensions of approximately 10 ft. in width, 10 ft. in height, 17 ft. in length and accommodating a web travel of 35 ft. The makers claim production speeds of 10-30 yd. per minute can be obtained, depending upon the thickness of fabric coating to be fused.

* * *

The Babcock & Wilcox Tube Company has just released a new edition of its bulletin on B. & W. Croloys giving technical data on high temperature steels for alloy tubes and pipe. The bulletin offers condensed information in chart form on such factors as creep strength, short time tensile strength, oxidation and corrosion resistance, temper embrittlement and minimum physical properties. It is designed as a convenient guide showing some of the materials which are available for processing into tubes and pipe for meeting varied high-temperature requirements. The company's advertising department is at 85 Liberty Street, New York City.

No Scientific Exchange

Rockefeller Funds Withheld from U.S. Body

FOLLOWING unsuccessful attempts extending over two years, to secure a ruling from the U.S. Treasury Department regarding acceptance of a grant from the Rockefeller Foundation, the American-Soviet Science Society has announced that it must cease aiding the interchange of scientific ideas between U.S. and Soviet scientists.

In a letter to members of the society, the executive council declares: "We regret that the American-Soviet Science Society has had to cease its activities because of lack of funds. For two years we have been striving to obtain tax exempt status from the U.S. Treasury Department. Without this status we could not receive the funds which the Rockefeller Foundation granted the society in 1946. The Treasury Department has thus far failed to act on our application and has indicated that this is because the House Un-American Activities Committee is investigating Dr. E. U. Condon, one of the members of our executive committee."

The society was formed in 1943 as the Science Committee of the National Council of American-Soviet Friendship. In May, 1946, this affiliation was dissolved. The purpose of the society was to promote good relations between scientists of both countries, particularly by interchanging and translating scientific publications. Although the National Council of American-Soviet Friendship was recently described as a subversive organisation by the attorney general's office, the science society was not placed in the same category.

U.S. CHEMICAL STATISTICS

THE production of industrial inorganic chemicals in the U.S.A. during May was considerably higher than in the preceding month or at the same time last year, reports the U.S. Bureau of the Census.

Record production levels were reached during May for salt cake, hydrogen, monobasic sodium phosphate and molybdate chrome orange. Other important inorganic chemicals for which increased production was reported for May were synthetic ammonium sulphate, calcium carbide, carbon dioxide, hydrochloric acid, oxygen, phosphoric acid, soda ash, caustic soda, and sulphuric acid.

The more important inorganic chemicals for which production decreases were reported for May as compared with April were synthetic ammonia, ammonium nitrate, and nitric acid.

Fuel Saving

Renewed Economy Campaign in 1949

THE Fuel Efficiency Committee of the Ministry of Fuel and Power at its last meeting welcomed the decision of the Minister to hold, in 1949, a conference on the general lines of the "Fuel and the Future" Conference held in London in October 1946.

Among other questions, the committee discussed suggestions that further surveys should be made of fuel and power consumption per unit of output in various industries and agreed that a number of such investigations should be carried out under the guidance of Regional Fuel Efficiency Committees. It was also pointed out that there was considerable room for higher efficiency in the use of fuel and power in drying processes throughout the industry and the committee concluded that all Regional Fuel Efficiency Committees should be invited to look into this problem as it affected industries within their regions.

Recognising the importance of adopting methods of using lower grade fuels in industry, the committee emphasised the importance in this connection of the closest relationships between users and the suppliers. There was general agreement on the need for maintaining and extending fuel watching and of applying the methods of joint consultation to problems of fuel efficiency in individual factories. It was felt that a similar approach would be valuable in securing the reduction of peak hour electricity consumption in non-industrial and commercial concerns.

The committee considered that there was still a great deal to be done towards educating all those in any way concerned with the use of fuel and power, and recommended that the Ministry's Education Sub-Committees, which were well qualified to advise on the special problems involved, should be given the fullest support.

Dunlop's in New Zealand

Early next year the Dunlop Rubber Company will be producing tyres from a new factory now being built at Upper Hutt in New Zealand. The main building, of three acres under one roof, will be one of the largest industrial buildings in the Dominion. Most of the machinery, incorporating the latest developments of tyre building, is already in New Zealand and the factory itself is being completed with cement from England and steel from Australia. Initially it will employ 300 men and women, most of them New Zealanders. A number of technical experts are going out from Fort Dunlop to train key operators.

A CHEMIST'S BOOKSHELF

Technology of Light Metals (Technologie der Leichtmetalle). By Dr. Ing. Alfred von Zeerleder. Zürich: Rascher Verlag. Pp. 364. Swiss fr. 45.

The author, professor of the Technical High School, Zurich, and director of the Research Institute Neuhausen of the Aluminium Industry A.G., Chippis, collates in this book a wide-ranging assembly of data which hitherto have been widely scattered throughout the literature. It is the first book to assemble such a large body of information on this subject, and much of the content is new, based on the author's work with the oldest aluminium factory (since 1888), which has always been highly progressive. Besides aluminium, the book deals more briefly with magnesium, in proportion to its smaller use—world production is only some 10 per cent of that of aluminium. The 18 chapters of the book are divided into four main parts: general, casting and milling, machining operations, and assembling. The historical development of light metals, their production and alloys are dealt with in the introduction, and there follow detailed descriptions of the customary alloys, their composition, physical and chemical properties, constructive use, forming and corrosion protection. The subsequent chapters describe the various technological treatments, such as casting, die-casting, forging, rolling, extrusion processes, machining, soldering, assembling, etc. The book deals also with furnaces, with annealing methods and with surface protection. It contains a comprehensive list of international trade names and standards, bibliographical references and a name and general index. 396 clear illustrations and photographs help to elucidate all phases of the book, which should appeal not only to those concerned with the technology of light metals, for there is also much for those interested in the scientific principles which form the background of light metallurgy.

The Diary and Sundry Observations of Thomas A. Edison. Edited by Dagobert D. Runes. 1948. New York: the Philosophical Library. Pp. 244 + III. $4.75.

The intimate acquaintance, which this book makes possible, with some of the workings of this mind of extraordinary vigour, to which we owe so many profound technical advances of the past 60 years, is accompanied by some surprises. There is at the beginning of the book—the diary—the shock of discovery that Edison's, like so many other powerful intellects, was capable when " off duty " of committing to paper jottings of absurd triviality which not even the jotter can seriously have considered worthy of preservation. The editor, like many another in similar circumstances, thought otherwise, possibly feeling that nothing should be allowed to come between the reader and the mind of the writer, not even the pruning shears. It is, therefore, for the sundry observations that this book is notable, and the revelation of how little conventional equipment in the way of scientific apparatus or traditional education was granted to the man whose applications of the sciences of sound and optics had such revolutionary results. His observations are generally highly original and occasionally unorthodox: deafness, from which he suffered all his life, he counts among the greatest of intellectual aids; and any form of education which does not produce a highly developed memory and a storehouse of facts is scarcely worth having. In 1922 he foresaw: " There will one day spring from the brain of science a machine or force so fearful in its potentialities . . . that even man, the fighter who will dare torture and death in order to inflict torture and death, will be appalled, and so will abandon war for ever. . . . But before we harness atomic energy we shall solve other problems. We shall probably utilise the motion of the earth through space. . . . So far as atomic energy is concerned, there is nothing in sight just now. . . ."

* * *

The Society d'Editions Scientifiques, 13 rue Racine, Paris 6, announces the publication of " Dix Ans d'application de la Radioactivité Artificielle," by Pierre Sue, a director of the laboratory of nuclear chemistry of the Collége de France. There is a preface by the Nobel prizewinner, Frédéric Jolliot Curie.

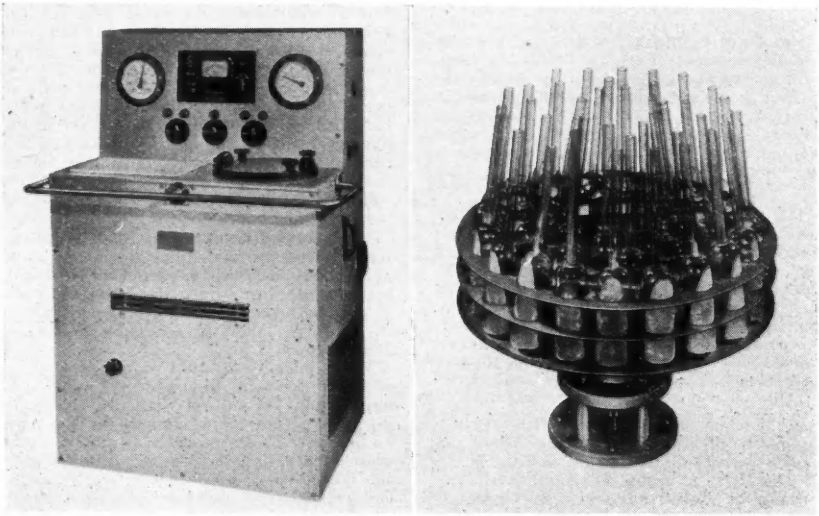
TECHNICAL NEWS AND SUPPLIES

A BRANCH of the chemical industry which assumed sufficient importance to rank as an independent industry—the manufacture of plastics—is fortunate in having at its disposal a very comprehensive and in many ways a most valuable commercial-cum-technical book of reference. The 18th appearance of the British Plastics Year Book follows the style of previous editions, both in subject matter and lay-out of sections. These consist of editorial, materials, manufactured products, plant and equipment, glossaries, names and address (firms, associations, consultants, etc.), "Who's Who," and technical and general data. A convenient and most sensible feature is the easy accessibility provided by a robust, coloured (numerical and inscribed) thumb-index. In keeping with the ever-increasing number of proprietary names and technical terms now in use in this field, the publishers have done well to expand this section. Each section is preceded by a comprehensive index (conveniently located on the tab-page) for speedy reference. *British Plastics Year Book*, 1948, 30s. net, 479 pp., Iliffe & Sons, Ltd., Dorset House, Stamford Street, S.E.1.

The well-known Swiss chemical and pharmaceutical concern, B. Siegfried, Zofingen, has recently issued, on the occasion of the 75th anniversary of its formation, an attractive publication under the title "75 Years Siegfried." The booklet gives many interesting details about the establishment of the chemical industry in Zofingen and the part played in this development by various members of the Siegfried family. Of special interest is the chapter giving a description of the present position of the company.

* * *

The subject of bridge measurement of electrical values—in particular that suggested by Professor Schering in 1920 and developed and improved by a number of workers since—is the subject of an article by R. J. Stanley in the July isssue of "Technique." It is supported by line and half tone illustrations. A complementary article by W. C. Lister illustrates the importance of screens and guard rings in electrical measurements. "Technique" is published by Muirhead & Co., Ltd., Beckenham, Kent.



Apparatus manufactured by W. Edwards & Co. (London) Ltd. and incorporating new developments in freeze-drying technique ("The Chemical Age," July 10). Shown here are a Model 3 centrifugal freeze-dryer for materials in bulk or ampoule quantities and (right) a centrifuge head dismounted from the drying chamber showing the thin wedges of dried material in the ampoules

Personal

MR. H. C. STREET has been elected a director of the British Metal Corporation.

MR. OLIVER LYTTELTON has been elected the first president of the Sheet Metal Industries Association.

MR. WILLIAM JOHN HINDS, tanning materials manager for J. H. Fleming & Co., Ltd., Warrington, and member of the International Society of Leather Chemists, died intestate, leaving gross £1146, net £1102.

ENG. VICE-ADMIRAL SIR HAROLD BROWN, chairman of the Fuel Research Board, has accepted the presidency of the British Internal Combustion Engine Manufacturers' Association, succeeding the late Viscount Bennett.

MR. W. L. TREGONING, who has been appointed industrial adviser to the Finance Corporation for Industry, was director of ammunition production at the Ministry of Supply, 1939-45, and is director of the Byrnes Steel Works and the Jackson Electric Stove Co.

MR. JACK COCHRANE, director of research and development, Formica Insulation Company, Cincinnati, has been awarded the highest honour bestowed by the American plastics industry—the John Wesley Hyatt award—for work on Formica and other laminated plastics, now being developed in the U.S.A. by De La Rue Insulation, Ltd.

The following English scientific workers have been awarded fellowships in Canada's National Research Laboratories: D. ATACK and S. BYWAER (Leeds University), R. E. DERIAZ (Birmingham), V. R. GRAY and K. J. IVIN (Cambridge), J. POWLING (Imperial College, London), A. F. TROTMAN-DICKINSON (Oxford), W. F. COCKBURN and E. SCOTT (Glasgow), and C. R. MASSON (Aberdeen).

In London on Tuesday H.R.H. Prince Bernhard of the Netherlands presented GROUP CAPTAIN C. S. MORICE, D.S.O., M.C., of Dunlop's Aviation Division, with the insignia of Commander of the Order of Orange Nassau conferred on him by Queen Wilhelmina. The Group Captain was in command of No. 121 Wing, RAF, at the aerodrome Volkel in 1944 where, states the citation, "through his excellent work he greatly contributed to the liberation of the Netherlands."

Obituary

MR. JOHN LEONARD FIRTH, founder and head of the Dewsbury dyeing firm of Leonard Firth, Ltd., has died at Leeds aged 78.

The death has occurred at Whitecraigs, Glasgow, of MR. ELIJAH PAGE, M.I.S.E., managing director of the Steel Construction Company, Ltd., Wishaw and Glasgow. He was 65.

The death has occurred at his home, 9 Carfin Road, Craigneuk, Wishaw, of BAILIE PETER O'CONNOR, a steelworker, who was chairman of the local branch of the British Iron and Steel and Kindred Trades Association. Mr. O'Connor, who was 49, was employed at the Clyde Alloy Steel Works, Netherton, where he was works delegate.

MR. PHILIP GEORGE GREGORY MOON, resident director of Bournemouth Gas and Water Company, whose death occurred suddenly on July 21, was a director of Prince Regent Chemicals and among his other activities he was a member of the British Gas Council executive committee and of the Gas Research Board; chairman of the Southern Region Gas Engineering Advisory Board; chairman of the South Western Tar Distilleries; and a member of the Tar Research Board. Mr. Moon was awarded the O.B.E. for the valuable work he did in connection with the construction, at Poole gasworks during the war, of a large plant for the manufacture of hydrogen for filling barrage balloons, the first of its kind. Since the war he had been actively engaged in the design and construction of a large new waterworks situated on the River Avon.

MR. HARRY BREARLEY, the Sheffield metallurgist, who discovered stainless steel, died at Torquay on July 14, aged 77. He began his working life as a cellar-boy in a Sheffield steelworks and later became head of the research laboratory of Thos. Firth and John Brown, Ltd.

While engaged in 1913 on the production of steel resistant to erosion in rifles and naval guns, he noticed that steels containing a large chromium content did not rust on exposure to laboratory atmosphere. From these observations he was led to investigate the composition of chromium steels practically resistant to ordinary corrosion and a year later the first commercial application of his experiments resulted in stainless steel cutlery.

In 1920 he was awarded the Bessemer medal of the Iron and Steel Institute and was made a Freeman of Sheffield in the same year.

Home News Items

'Phone Shortage.—According to the Post Office, a large proportion of the telephones manufactured in this country, is still being reserved for export.

New Postage Stamp.—The Post Office announces that a £1 stamp is to be added to the permanent series of postage stamps. It is hoped to have this new stamp on sale by October 1 this year.

Accident to Acid Tanker.—A road tanker carrying 11 tons of sulphuric acid, leaving I.C.I., Ltd., Huddersfield, recently, collided with a trolley-bus standard and crashed through a wall. The driver was not injured and the acid did not escape.

Industrial Sites in Scotland.—More than 450 industrial sites, suitable for factories or other commercial buildings, are on a new register which has been compiled by the Scottish Department of Health. All of them are judged satisfactory from the point of view of communications and services.

Foundry Painting Order.—Britain's 2000 ironfoundries, under a new order which comes into effect on August 1, will have their inside walls and ceilings washed, painted, white-washed or colour-washed at least once in every 14 months. Only walls and ceilings above 20 ft. from the floor are exempt.

Longest Conveyor Belt.—Miners at Silksworth Colliery, Sunderland, postponed their annual holiday this week to undertake the installation of the largest underground conveyor belt in the country. The belt, 1600 yards long and weighing 40 tons, will carry 2000 tons of coal from the pit face every 12 hours.

Cokemen's Demands.—Resolutions calling on the National Coal Board to supply them with protective clothing, bathing accommodation and for the classification of certain diseases, including gastritis, as industrial diseases, were passed by the NUM cokemen's area conference at Bridlington last week.

Murex Offers Zirconium Hydride.—Murex, Ltd., of Rainham, announces that it is now producing zirconium hydride, a product which previously had to be imported from the U.S.A. The company hopes to satisfy the entire domestic demand for this material. It is made in powder form, and contains about 98 per cent Zr, the balance being mainly hydrogen.

Platinum Prices.—Some prices of platinum in New York this week were raised $5 per ounce, bulk quantities costing $93. London quotations were £19 10s. to £24

Strike Ended.—Electricians who for 10 days had been on strike at the atomic research establishment at Salwick, near Preston, Lancashire, returned to work on July 22.

Blast Furnace Order.—Ashmore, Benson, Pease & Co., Ltd., Stockton, has received an order from the South African Iron & Steel Industrial Corporation for a blast furnace which will produce 850 tons of iron daily.

Italians See English Plastics Produced.—A party of Italian politicians and journalists visited the new De La Rue Insulation, Ltd. factory at Newcastle to watch the production of formica, decorative laminated plastic, on the largest press in the world. The delegation was received by the works director, W. F. Campling.

Government Control Order Revoked.—The Ministry of Supply announced last week that the statutory control of hand tools had been revoked. It was added that the industries concerned had undertaken to co-operate with the Ministry in continuing to carry out Government policy, especially as regards exports, and to provide production statistics.

Paper Firm's Record Output.—After 10 years of intensive laboratory research on new methods of producing paper from straw, L. Tait & Son, Ltd., of Inverurie, Scotland, recently reported an increased output of over 20 per cent on pre-war figures. The firm's achievement receives special mention in the current Government White Paper on Scottish industry.

Scottish Holidays.—The current holiday period in the West of Scotland has greatly reduced production and trading in chemicals, and the opportunity is being taken at many plants to carry out alterations and renewals during the holiday break and to renew equipment and plant where this was necessary.

Miners' Holidays.—The reduction by some 380,000 tons in coal output last week is attributed chiefly to the occurrence of the recognised holidays in the coalfields. This was responsible for about 300,000 tons of the falling off. Total output for the week, aided by a small increase in opencast production, was 3,599,800 tons.

Parliamentary Topics

German Fertiliser Production.—Mr. R. Stokes asked for information on the production of artificial fertilisers in Germany in relation to the level of industry plan. Mr. C. P. Mayhew, in his reply, said that artificial manures were not separately treated in the plan, but the position with regard to the three main chemical fertilisers was as follows. No restriction had been applied to production of potash. Phosphates formed part of the group of basic chemicals restricted to 105 per cent of 1936; but within this group no limit had been placed on the production of phosphates, which is being increased in every possible way. Production of synthetic ammonia has been provided for at the rate of 124 per cent of 1936 output.

Engineering Mission to Canada.—Replying to a question from Mr. Errol, Mr. A. G. Bottomley said that the objects of the forthcoming Engineering Mission to Canada were to investigate market possibilities mainly for the heavier types of industrial engineering equipment; to obtain first-hand information on any difficulties in regard to trade with Canada in the engineering industry, and to advise on the most suitable methods to adopt to secure a greater volume of exports from this country. The leader of the mission would be Mr. E. H. Gilpin, of Baker Perkins, Ltd. Other members would be:—

Mr. N. Neville (associate organiser of the mission) Director of the British Chemical Plant Manufacturers Association; Mr. E. B. Ball, Glenfield & Kennedy, Ltd.; Mr. A. W. Berry, The British Engineers' Association; Mr. W. R. Beswick, The Power Gas Corporation and of Ashmore, Benson, Pease and Co., Ltd.; Mr. D. M. Buist, The British Electrical & Allied Manufacturers' Association; Mr. F. C. Fitzpatrick, Amalgamated Engineering Union; Mr. A. G. Grant, Whessoe, Ltd.; Mr. C. S. Robinson, Thomas Robinson & Son, Ltd.; Mr. H. V. Yorke, Bennett, Sons & Shears, Ltd., and H. Pontifex & Sons Ltd.

The mission will be accompanied by a representative of the Ministry of Supply, and by one of the U.K. Trade Commissioners in Canada.

Sodium Chlorate.—Arising from a question from Mr. G. Lambert, Mr. Harold Wilson said that the allocation of supplies of sodium chlorate was made by the one firm responsible for its manufacture, and consequently he could give no production figures. Railways, textiles, dyestuffs, and metal refining industries were regarded as priorities for this material. The remainder was reserved for farmers. When Mr. T. Driberg asked whether the production and allocation of the chemical was in the hands of a monopoly and, if so, would it come within the scope of the new measure, Mr. Speaker intervened with: "That does not arise on this question."

Cost of Industrial Coal.—When Mr. Wm. Shepherd asked for the amount of percentage increase in the cost of coal to industrial users at the present time compared with 1937, Mr. H. T. Gaitskell first regretted the information was "not available," then explained the difficulty was due to the fact that the precise thermal value of pre-war coal was unknown.

Killing Whales.—In reply to a question from Mr. Skeffington Lodge, Mr. T. Williams, Minister of Agriculture, said that an apparatus had been developed for killing whales by electricity. A British whaling company would try it out during the coming season.

Tenders Invited—Value: 15s.—The circumstances in which 12 contractors were invited to submit tenders on Form 57366 WT 14645-0032 for the supply of 3½ lb. and 3 lb. of strip steel required for the ROF, Blackburn, were the subject of several questions by Mr. Peter Freeman and others. Mr. G. R. Strauss said 12 contractors were asked to tender for material costing about 10s. and eight for material worth about 5s. "This procedure was not appropriate for the purpose and should not have been used."

Monopolies: Inquiry and Control.—The House accepted an amendment from the House of Lords changing the title of the Monopoly (Inquiry and Control) Bill to the Monopolies and Restrictive Practices (Inquiry and Control) Bill. Mr. Harold Wilson said it was essential that the procedure should follow two stages, inquiry and control, and he thought it would make more clear the purpose and method if the phrase was included.

Payment of Expenses.—Among a number of amendments made in the Lords during the Report stage of the Bill, was one to Clause 8, which will now allow the Monopolies Commission to pay expenses properly incurred by firms in submitting information required by that body. An amendment to Clause 9, now gives the BoT powers to omit from its report information such as trade secrets or the location of minerals which might have an adverse effect on the interests of traders or the country.

Fire at Tar Works.—Damage was confined to an asbestos roof above the tank when 200 gallons of naphtha burst into flames in a still at the Lancashire Tar Distillers works at Bootle (Lancs.). The Bootle Fire Service prevented the blaze spreading to a larger tank containing 4000 gallons of crude fluid and within 15 minutes the outbreak was extinguished.

Overseas News Items

Iron-ore Deposits Discovered in Iraq.—Valuable deposits of iron ore containing 72 per cent iron and 7 per cent copper have been discovered in North Iraq. Exploitation is to be started shortly.

Swiss Soda Works Increases Capital.—To strengthen its working capital, the Swiss Soda Factory, Zurzach, has recently taken up a public loan of 7.5 million Swiss francs at 3½ per cent. The company is the only Swiss producer of soda products and meets practically the whole of the country's requirements.

Brazilian Manganese.—Brazil's output of manganese rose to 451,507 tons in 1947 from 172,264 tons in 1946. Most is derived from the State of Minas Gerais, but large deposits also exist in the States of Bahia and Mato Grosso. It is becoming of increasing importance, due mainly to uncertainty of supplies from the world's largest producers, Russia and India.

Australia's Uranium Deposits.—According to a recent report issued by the Australian News and Information Bureau in New York, uranium ore fields in southern Australia are proving more extensive than originally was anticipated. Rich deposits have been discovered at Radium Hill, where four lodes have been defined and East Mount Painter, where new plant, including air compressors, is being installed.

Australia to Increase Coal Output.—The Joint Coal Board in New South Wales has prepared an ambitious scheme for the mechanisation of the industry, in an attempt to increase production by 6.6 million tons a year within the next four years. Opencast production in 1948 is expected to total 2 million tons, compared with 50,000 tons six years ago. Specially built mining towns with improved living accommodation are also contemplated by the authorities.

Two-year Plan for Soviet Zone.—A two-year economic plan for the Soviet zone of Germany, covering the years 1948-1950, has been elaborated by the German Economic Commission and approved by the Russian military authorities. It proposes, *inter alia*, a lignite output of 123 million tons, *i.e.*, an increase by 21½ per cent over 1936. Steel output is to reach 850,000 tons, and that of rolled metal 650,000 tons. Output of the chemicals is planned at 146 per cent over the 1947 level, while synthetic liquid fuel production is to be 29 per cent higher than last year.

Tin for Hungary.—In addition to interim allocations of tin metal for the second half of 1948, Hungary, states the Ministry of Supply, is to receive an allocation of 125 long tons.

New Russian Blast Furnace.—Blast furnace No. 4 was started at the end of June at the Zaporozhye iron and steel works. It is reported to have been erected in the record time of 3½ months and to be fully automatic and very economical in operation.

German Aluminium Plant Re-opens.—Another German aluminium works, the Rudolf Fissler factory at Idar Obenstein, in the French zone of Germany, has resumed production. Output will be confined to household aluminium ware, the bulk of which will be exported.

U.S. Foundry Conference.—The 1949 Foundry Congress of American Foundrymen's Society, the technical organisation of the castings industry, will be staged in St. Louis, Mo., next May 2-5. It is anticipated that 5000 delegates from foundry centres throughout the world will attend. This will be the 53rd annual congress of the society, which now has some 10,000 members.

New Canadian Chemical Company.—The newly-formed Atlantic Chemicals Co., Ltd., New Brunswick, Canada, is to commence the production of sulphuric acid and superphosphate for the Maritime Provinces market. The sulphur will be obtained from large anhydrite deposits near the firm's plant and the phosphate rock imported from North Africa or the U.S.A.

Israel Government Operates Haifa Refinery.—The Haifa oil refinery, which is mainly British-owned, has begun operations on direct orders from the Provisional Government of Israel. Two hundred Jewish workers were reported on July 23 to have started production of benzine, kerosene, butane gas and heavy fuel oil from crude oil obtained from undefined sources.

U.S. Atomic Standstill?—According to Prof. Robert Boarts, of Oak Ridge Atomic Research Plant, U.S. atomic research is suffering from lack of new ideas. Addressing the American Society for Engineering Education, he blamed the secrecy of atomic research and the regimentation of scientists in atomic work. "Most research scientists cannot work in this atmosphere," said Prof. Boarts. "Haste and the search for efficiency have also militated against the flow of new ideas in atomic fission."

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

CASTLE CASTINGS, LTD., Clitheroe. (M., 31/7/48.) June 16, mortgage to Martins Bank, Ltd., securing all moneys due or to become due to the bank; charged on Brooks Works (formerly Brooks Mill), Waterloo Road, Clitheroe, with plant, machinery, etc.

FERRAND LUTTMER PLASTICS, LTD., Felpham. (M., 31/7/48.) June 21, £4900 debenture to G. W. Ferrand, Chichester; charged on company's undertaking and property present and future.

GORNEY, LTD., Manchester, (M., 31/7/48.) June 24, mortgage to Midland Bank, Ltd., securing all moneys due or to become due to the bank; charged on land and premises at Broughton Road, Salford, formerly known as Pendleton Club and later known as Bijou Picture Theatre or Bijou Picture House, together with fixtures. *Nil. October 17, 1947.

MERRIGLO (PLASTICS), LTD., London, S.W. (M., 31/7/48.) June 23, debenture to Plastic Materials, Ltd., securing £5000 or such smaller sum as may be outstanding; general charge. *£3000. December 23, 1947.

MULA (CHEMICALS), LTD., Birmingham. (M., 31/7/48.) June 21, mortgage to District Bank, Ltd., securing all moneys due or to become due to the bank; charged on land and premises known as Burstow Park, Burstow. *—. June 19, 1947.

T. B. & J. PUTTICK, LTD., Haslemere, glass and ironworkers, etc. (M., 31/7/48.) June 23, £3500 (not ex.) and £1500 (not ex.) mortgages to Lloyds Bank, Ltd.; respectively charged on land with buildings thereon at West Street and at Lower Street, both Haslemere. *Nil. December 31, 1947.

M. G. SOUTHALL, LTD., London, N.W., plastic manufacturers, etc. (M., 31/7/48.) June 17, £800 debentures; general charge. *Nil. September 17, 1947.

B. WARDMAN & SONS (LEEDS), LTD., chemical manufacturers. (M., 31/7/48.) June 15, mortgage to Leeds Permanent Building Society securing £8000 and further advances; charged on 6 White Horse Street, Leeds. *Nil. December 31, 1946.

Satisfactions

HAILWOOD & ACKROYD, LTD., Morley, glass manufacturers. (M.S., 31/7/48.) Satisfaction June 25 of mortgage registered January 31, 1935.

MERRIGLO (PLASTICS), LTD., London, S.W. (M.S., 31/7/48.) Satisfaction June 23, £3000, registered February 19, 1947.

Company News

The name of **Chemi-Synthetics, Ltd.**, 79 St. James Street, S.W.1, has been changed to **Amber Pharmaceuticals, Ltd.**

The name of International Chemical Research Association, Ltd., 69 Fleet Street, E.C.4, has been changed to **Renipas Chemical Company, Ltd.**

The capital of **Lewis and Haynes, Ltd.**, 38 Poole Road, Westbourne, Bournemouth, has been increased by £4000 beyond the registered capital of £3500.

Metal Industries, Ltd., has declared a final dividend of 7 per cent on the "A" and "B" ordinary shares for the year ending March 31 last. The total distribution is therefore 10 per cent, the same as last year.

The directors of **Benn Brothers, Ltd.**, have recommended the payment of the following final dividends, less tax, for the year ended June 30, 1948: 3 per cent on preference shares, making 6 per cent for the year; 20 per cent on ordinary shares, making 25 per cent for the year (same); 5s. per share on the deferred shares (same).

New Companies Registered

Forrans, Ltd. (455,334).—Private company. Registered June 11. Capital £2000. Manufacturers of and dealers in chemicals, gases, drugs, etc. Directors: Cecil A. Forran, and Leslie W. Forran. Reg. office: 75 Hinckley Road, Leicester.

Thomson, Skinner & Hamilton, Ltd. (26,426). — Private company. Capital £200,000. Chemical manufacturers and merchants, manufacturers of scientific instruments, etc. Subscribers: H. Clift, W. H. Lancaster, W. Stewart and C. Barclay, 5 Dalziel Drive, Glasgow, S.1.

Perennol Chemicals, Ltd. (457,257).—Private company. Registered July 10. Capital £100. Manufacturers of and dealers in chemicals, cleaning materials, drugs, plastics, etc. Secretary: Roy D. Houseman. Reg. office: 55 Whitecross Street, E.C.1.

Chemical and Allied Stocks and Shares

THE fact that many shares are now at their lowest level since the war, and the decrease in pessimism over the Berlin situation, were factors which induced a rally in stock markets. There was not much buying by the public, but professional "bear" covering developed and, as expected, shares of chemical and kindred companies reflected the ruling trend of markets.

Imperial Chemical fluctuated moderately, but at 45s. 9d. were higher on balance, owing to a realisation that the yield compares favourably with the return on other leading industrials, and that the directors have expressed confidence in the 10 per cent dividend being maintained in future on the larger capital. Monsanto Chemicals 5s. ordinary were 57s. 9d., Fisons 57s. 6d., Greeff-Chemicals Holdings 5s. shares 13s. 9d., while Albright & Wilson 5s. ordinary transferred around 27s. 9d. Elsewhere, B. Laporte 5s. units again changed hands around 20s. and Burt Boulton & Haywood marked 26s. at one time.

In other directions, the units of the Distillers Co. at 26s. 3d. were firm on the financial results, United Molasses rallied to 47s. and British Plaster Board were firmer at 24s. 3d. Lever & Unilever strengthened to 48s. on the results which reflect a big profit increase. Lever N.V. were also higher at 49s. 6d., and Turner & Newall rallied to 74s. 9d. British Aluminium were better at 47s. 3d. Yield on the latter is under 4¼ per cent, based on last year's 10 per cent dividend, and this payment can hardly be expected to increase while the voluntary dividend stipulation persists. On the other hand, the market believes that the company's profits are continuing to advance, and that it is likely to undergo further expansion over the next few years.

Prospects of eventual higher dividends are considered in the market to be promising, and it is assumed that sooner or later more capital will be required. This would be raised by a "rights" issue to shareholders. British Oxygen have strengthened to 95s. 7½d. This is an instance where it has been stated officially that more capital will be required in future. Apart from trade expansion and efforts to expand business overseas, many companies are faced with the problem of carrying much larger stocks than hitherto, and, moreover, prices of materials and equipment are increasing.

Owing to these and similar factors, there are numerous applications for permission to raise more capital being made to the Capital Issues Committee, but many are not sanctioned for various reasons, preference being given to the requirements of companies playing a vital part in the export drive. Nevertheless, if the present rally in market is maintained, another new issue is predicted in September.

Iron and steel shares have participated in the general improvement, United Steel being 28s., Dorman Long 29s. 4½d., Colvilles 33s., Stewarts & Lloyds 52s. 4½d., and Tube Investments £6. Among other shares, T. W. Ward strengthened to 57s., Babcock & Wilcox to 66s. and Ruston & Hornsby were 51s. ex rights to the new shares, the latter being 1s. 5d. premium.

Boots Drug firmed up to 48s. 9d., while Beechams deferred were better at 19s. 4½d. with Sangers 29s. 6d. and Timothy Whites 34s. 4½d. De La Rue rallied moderately to 38s. 9d., British Industrial Plastics 2s. ordinary were 6s. 10½d. and British Xylonite £5⅛. Elsewhere, Courtaulds improved to 37s. 9d., and oils made moderate response to the better market trend, Anglo-Iranian being £8 3/16, Shell 75s. 7½d. and Trinidad Leaseholds 30s. 6d. Paint shares were better with International Paint higher at £7⅜ on the proposal to "split" the £1 units into five of 4s. each.

MALAYAN RUBBER

THE Malayan Government representative in London, states that stocks of rubber in the Federation of Malaya, as at April 30 last, amounted to 95,372 long tons (dry weight). Of this total 25,098 tons were on estates; 52,231 tons in the hands of dealers and 18,043 tons at ports awaiting shipment. Imports of rubber in May totalled 3,065 tons.

Production of rubber during May amounted to 49,607 tons, 33,294 tons from estates and 16,313 tons small holdings.

Stocks of rubber as at May 31 last totalled 82,364 tons (on estates 24,327 tons, with dealers 47,853 tons and at ports awaiting shipment 10,184 tons).

Dealers' stocks of rubber in June amounted to 64,730 tons, and port stocks in private lighters and railway godowns totalled 18,692 tons. Imports of dry rubber in June amounted to 19,902 tons.

Copper Exploitation in Chile.—The Chile Copper Co., a subsidiary of the Anaconda Copper Mining Co., is reported to have completed successfully negotiations with the Government of Chile with regard to the company's investment programme. The provision of new plant for the exploitation of Chile's copper resources, valued at £130 million has been decided upon.

Prices of British Chemical Products

WITH the overall supply position remaining rather tight or at most barely sufficient to meet current requirements there has been nothing of outstanding importance to report on the industrial chemicals market during the past week. The seasonal contraction in demand is less apparent as far as new business is concerned although consumers delivery specifications under existing contracts have been reduced with the approach of the holiday season. The price position so far as the soda products and other routine chemicals are concerned continues steady and the undertone is firm. The volume of export inquiry has been fully maintained and similar reports have been received from the tar products market. There appears to be little likelihood of any change in the position of the coal-tar products market for some time to come.

MANCHESTER.—A good many chemical-consuming works in the Lancashire area are closed for the annual holiday and this has affected the call for deliveries and also the amount of new business passing on the Manchester market. In spite of this seasonal influence there is, however, a substantial aggregate movement of supplies of caustic soda and other alkali products, with the potash, magnesia and ammonia compounds and a wide range of general chemicals also meeting with a steady demand. So far as prices are concerned, undertone remains firm in virtually all sections. A moderate trade is passing in fertiliser materials. In the tar product market buying interest has been maintained and good deliveries are being taken.

GLASGOW.—Business in the Scottish chemical market is quiet, as is usual at this time of the year. Many firms are closed for the holidays. There is not likely to be much alteration in the position until the beginning of next month. There have been small decreases in prices of a number of chemicals recently and there is a welcome sign of a general, if small, downward trend. In the export market, interest in all types of chemicals has been well maintained, although a number of orders have been small, due to the continually recurring import licencing and currency difficulties. There was a slight improvement earlier in the year as a result of trade agreements, but the general position is far from satisfactory.

Price Changes

Rises: Ammonium bicarbonate, lactic acid, pyridine.

General Chemicals

Acetic Acid.—Maximum prices per ton: 80% technical, 1 ton, £64; 80% pure, 1 ton, £66; commercial glacial 1 ton £79; delivered buyers' premises in returnable barrels: £4 10s. per ton extra if packed and delivered in glass.

Acetic Anhydride.—Ton lots, d/d, 11¾d. per lb.

Acetone.—Maximum prices per ton, 1/5 tons, £76 10s.; single drums, £77 10s.; delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each. For delivery in non-returnable containers of 40/50 gallons, the maximum prices are £3 per ton higher. Deliveries of less than 10 gallons free from price control.

Alcohol, Industrial Absolute.—50,000 gal. lots, d/d, 2s. 7½d. per proof gallon; 5000 gal. lots, d/d, 2s. 10½d. per proof gal.

Alum.—Loose lump, £16 per ton, f.o.r. MANCHESTER: £16 10s.

Aluminium Sulphate.—Ex works, £11 10s. per ton d/d. MANCHESTER: £11 10s.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Bicarbonate. — MANCHESTER: £46 per ton d/d.

Ammonium Carbonate.—£42 per ton d/d in 5-cwt. casks. MANCHESTER: Powder, £50 d/d.

Ammonium Chloride. — Grey galvanising, £22 10s. per ton, in casks, ex wharf. Fine white 98%, £21 to £25 per ton. See also Salammoniac.

Ammonium Nitrate.—D/d, £18 to £20 per ton.

Ammonium Persulphate.—MANCHESTER: £5 per cwt. d/d.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £78 and £76 10s. per ton.

Antimony Oxide.—£162 10s. per ton.

Antimony® Sulphide.—Golden, d/d, as to quantity, etc., 4s. to 5s. per lb.

Arsenic.—Per ton, £40 5s. to £41 5s., according to quality, ex store.

Barium Carbonate.—Precip., d/d; 2-ton lots, £25 15s. per ton, bag packing, ex works.

Barium Chloride.—98/100% prime white crystals, 5-ton lots, £26 per ton, bag packing, ex works.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £26 10s. per ton d/d; 2-ton lots, £26 15s. per ton.

Bleaching Powder.—Spot, 35/37%, £11 10s. per ton in casks.

Borax.—Per ton for ton lots, in free 1-cwt. bags, carriage paid: Commercial, granulated, £30; crystals, £31; powdered, £31 10s.; extra fine powder, £32 10s. B.P., crystals, £39; powdered, £39 10s.; extra fine, £40 10s. Borax glass, per ton in free 1-cwt. waterproof paper-lined bags, for home trade only, carriage paid: lump, £77; powdered, £78.

Boric Acid.—Per ton for ton lots in free 1-cwt. bags, carriage paid: Commercial, granulated, £52; crystals, £53; powdered, £54; extra fine powder, £56. B.P., crystals, £61; powder, £62; extra fine, £64.

Calcium Bisulphide.—£6 10s. to £7 10s. per ton f.o.r. London.

Calcium Chloride.—70/72% solid, £5 15s per ton, ex store.

Charcoal, Lump.—£25 per ton, ex wharf. Granulated, £30 per ton.

Chlorine, Liquid.—£29 per ton, d/d in 16/17-cwt. drums (3-drum lots).

Chrometan.—Crystals, 5¾d. per lb.

Chromic Acid.—1s. 10d. to 1s. 11d. per lb., less 2½%, d/d U.K.

Citric Acid.—Controlled prices per lb., d/d buyers' premises. For 5 cwt. or over, anhydrous, 1s. 6¾d., other, 1s. 5.; 1 to 5 cwt., anhydrous, 1s. 9d., other, 1s. 7d. Higher prices for smaller quantities.

Cobalt Oxide.—Black, delivered, 6s. 7d. per lb.

Copper Carbonate.—MANCHESTER: 1s. 8d. per lb.

Copper Chloride.—(53 per cent), d/d, 1s. 10d. per lb.

Copper Oxide. — Black, powdered, about 1s. 4½d. per lb.

Copper Nitrate.—(53 per cent), d/d, 1s. 8d. per lb.

Copper Sulphate.—£42 10s. per ton f.o.b., less 2%, in 2-cwt. bags.

Cream of Tartar.—100%, per cwt., from 201s. to 205s. per cwt. lots, d/d.

Ethyl Acetate.—10 tons and upwards, d/d, £115 per ton.

Formaldehyde.—£31 per ton in casks, according to quantity, d/d. MANCHESTER: £32.

Formic Acid.—85%, £64 per ton for ton lots, carriage paid. 90%, £67 5s. per ton.

Glycerine.—Chemically pure, double distilled 1260 s.g., 123/1 per cwt. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hexamine.—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.

Hydrochloric Acid.—Spot, 7s. 6d. to 8s 9d. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. to 1s. 2d. per lb.

Hydrogen Peroxide.—1s. 0½d. per lb. d/d, carboys extra and returnable.

Iodine.—Resublimed B.P., 10s. 4d. to 14s. 6d. per lb., according to quantity.

Iron Sulphate.—F.o.r. works, £3 15s. to £4 per ton.

Lactic Acid.—Pale, tech., £75 per ton; dark tech., £65 per ton ex works; barrels returnable.

Lead Acetate.—White, 110s. to 115s. per cwt., according to quantity.

Lead Carbonate.—British dry, ton lots, d/d. £116 per ton.

Lead Nitrate.—About £115 per ton d/d in casks. MANCHESTER: £115.

Lead, Red.—Basic prices per ton: Genuine dry red lead, £106; orange lead, £118. Ground in oil: red, £132; orange, £144. Ready-mixed lead paint: red, £140; orange, £152 (subject to increase of £1 10s. per ton).

Lead, White.—Dry English, in 8-cwt. casks, £116 10s. per ton. Ground in oil, English, in 5-cwt. casks, £141 per ton.

Lime Acetate.—Brown, ton lots, d/d, £18 to £20 per ton; grey, 80-82 per cent, ton lots, d/d, £22 to £25 per ton.

Litharge.—£103 10s. to £106 per ton.

Lithium Carbonate.—7s. 9d. per lb. net.

Magnesite.—Calcined, in bags, ex works, £18 5s.

Magnesium Carbonate.—Light, commercial, d/d, £70 per ton.

Magnesium Chloride.—Solid (ex wharf), £27 10s. per ton.

Magnesium Oxide.—Light, commercial, d/d, £160 per ton.

Magnesium Sulphate.—£12 to £14 per ton.

Mercuric Chloride.—Per lb., for 2-cwt. lots, 7s. 6d.; smaller quantities dearer.

Mercurous Chloride.—8s. to 9s. per lb., according to quantity.

Mercury Sulphide, Red.—Per lb., from 10s. 3d. for ton lots and over to 10s. 7d. for lots of 7 to under 30 lb.

Methanol.—Pure synthetic, d/d, £28 to £38 per ton.

Methylated Spirit.—Industrial 66° O.P. 100 gals., 4s. 10d. per gal.; pyridinised 64° O.P. 100 gal., 4s. 11d. per gal.

Nickel Sulphate.—F.o.r. works, 3s. 4d. per lb.

Nitric Acid.—£24 to £26 per ton, ex works.

Oxalic Acid.—£128 to £133 per ton packed in free 5-cwt. casks.

Paraffin Wax.—Nominal.

Phosphoric Acid.—Technical (S.G. 1.500). ton lots, carriage paid, £61 per ton;

B.P. (S.G.1.750), ton lots, carriage paid, 1s. 1d. per lb.

Phosphorus.—Red, 3s. per lb. d/d; yellow, 1s. 10d. per lb. d/d.

Potash, Caustic.—Solid, £65 10s. per ton for 1-ton lots; flake, £76 per ton for 1-ton lots. Liquid, d/d, nominal.

Potassium Bichromate. — Crystals and granular, 9⅝d. per lb.; ground, 10⅜d. per lb., for not less than 6 cwt.; 1-cwt. lots, ½d. per lb. extra.

Potassium Carbonate.—Calcined, 98/100%, £64 per ton for 1-ton lots, ex store; hydrated, £58 for 1-ton lots.

Potassium Chlorate.—Imported powder and crystals, nominal.

Potassium Chloride.—Industrial, 96 per cent, 6-ton lots, £16.10 per ton.

Potassium Iodide.—B.P., 8s. 8d. to 12s. per lb., according to quantity.

Potassium Nitrate.—Small granular crystals, 76s. per cwt. ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 8½d. per lb. for 1-cwt. lots; for 3 cwt. and upwards, 1s. 8d. per lb.; technical, £7 14s. 3d. to £8 6s. 3d. per cwt., according to quantity d/d.

Potassium Prussiate.—Yellow, nominal.

Salammoniac.—First lump, spot, £48 per ton; dog-tooth crystals, £50 per ton: medium, £48 10s. per ton; fine white crystals, £21 to £25 per ton, in casks, ex store.

Salicylic Acid.—MANCHESTER: 1s. 11d. to 3s. 1d. per lb. d/d.

Soda Ash.—58° ex depôt or d/d, London station, £7 12s. 6d. to £8 7s. 6d. per ton.

Soda, Caustic. — Solid 76/77%; spot, £18 4s. per ton d/d.

Sodium Acetate.—£41 per ton, ex wharf.

Sodium Bicarbonate.—Refined, spot, £11 per ton, in bags.

Sodium Bichromate.—Crystals, cake and powder, 8d. per lb.; anhydrous, 7½d. per lb., net, d/d U.K. in 7-8 cwt. casks.

Sodium Bisulphite. — Powder, 60/62%, £28 7s. 6d. per ton d/d in 2 ton lots for home trade.

Sodium Carbonate Monohydrate.—£25 per ton d/d in minimum ton lots in 2-cwt. free bags.

Sodium Chlorate.—£45 to £47 per ton.

Sodium Cyanide.—100 per cent basis, 8d. to 9d. per lb.

Sodium Fluoride.—D/d, £4 10s. per cwt.

Sodium Hyposulphite.—Pea crystals 22s. 6d. per cwt. (2-ton lots); commercial, 1-ton lots, £16 per ton carriage paid. Packing free.

Sodium Iodide.—B.P., 10s. 2d. per lb. to 12s. 1d. according to quantity.

Sodium Metaphosphate (Calgon).—Flaked, loose in metal drums, £103 ton.

Sodium Metasilicate.—£19 5s. per ton, d/d U.K. in ton lots.

Sodium Nitrate.—Chilean Industrial, 97-98 per cent, 6-ton lots, d/d station, £19 15s. per ton.

Sodium Nitrite.—£22 per ton.

Sodium Percarbonate.—12½% available oxygen, £7 per cwt. in 1-cwt. drums.

Sodium Phosphate.—Di-sodium, £32 10s. per ton d/d for ton lots. Tri-sodium, £62 per ton d/d for ton lots.

Sodium Prussiate.—9d. to 9½d. per lb. ex store.

Sodium Silicate.—£6 to £11 per ton.

Sodium Silicofluoride.—Ex store, nominal.

Sodium Sulphate (Glauber Salt).—£8 per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. £6 per ton d/d station in bulk. MANCHESTER: £4 15s. per ton d/d station.

Sodium Sulphide. — Solid, 60/62%, spot. £23 per ton, d/d, in drums; broken, £23 15s. per ton, d/d, in casks.

Sodium Sulphite.—Anhydrous, £29 10s. per ton; pea crystals, £20 10s. per ton d/d station in kegs; commercial, £12 to £14 per ton d/d station in bags.

Sulphur.—Per ton for 4 tons or more, ground, £14 12s. 6d. to £16 17s. 6d., according to fineness.

Sulphuric Acid.—168° Tw., £6 10s. 2d. to £7 10s. 2d. per ton; 140° Tw., arsenic-free, £5 2s. 6d. per ton; 140° Tw., arsenious, £4 15s. per ton. Quotations naked at sellers' works.

Tin Oxide.—1-cwt. lots d/d £25 10s.

Titanium Oxide.—Comm., ton lots, d/d, (56 lb. bags), £97 per ton.

Zinc Oxide.—Maximum prices per ton for 2-ton lots, d/d; white seal, £75 10s.; green seal, £74 10s.; red seal, £73.

Zinc Sulphate.—No quotation.

Rubber Chemicals

Antimony Sulphide.—Golden, 3s. to 4s. per lb. Crimson, 2s. 7½d. to 3s. per lb.

Arsenic Sulphide.—Yellow, 1s. 9d. per lb.

Barytes.—Best white bleached, £8 3s. 6d. per ton.

Cadmium Sulphide.—6s. to 6s. 6d. per lb.

Carbon Bisulphide.—£37 to £41 per ton, according to quality, in free returnable drums.

Carbon Black.—6d. to 8d. per lb., according to packing.

Carbon Tetrachloride.—£50 10s. to £53 10s. per ton, according to quantity.

Chromium Oxide.—Green, 2s. per lb.

India-rubber Substitutes.—White, 10 5/16d. to 1s. 5¾d. per lb.; dark, 10½d. to 1s. per lb.

Lithopone.—30%, £33 12s. 6d. per ton.

Mineral Black.—£7 10s. to £10 per ton.

Mineral Rubber, "Rupron."—£20 per ton.

Sulphur Chloride.—7d. per lb.

Vegetable Lamp Black.—£49 per ton.

Vermilion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.

Nitrogen Fertilisers

Ammonium Phosphate.—Not quoted—temporarily unobtainable.

Ammonium Sulphate.—Per ton in 6-ton lots, d/d farmer's nearest station, in January, £10 5s., rising by 1s. 6d. per ton per month to March, 1948.

Calcium Cyanamide.—Nominal; supplies very scanty.

Concentrated Fertilisers. — Per ton d/d farmer's nearest station, I.C.I. No. 1 grade, where available, £14 18s. 6d.

"Nitro-Chalk."—£10 4s. per ton in 6-ton lots, d/d farmer's nearest station.

Sodium Nitrate.—Chilean super-refined for 6-ton lots d/d nearest station, £17 5s. per ton; granulated, over 98%, £16 per ton.

Coal-Tar Products

Benzol.—Per gal. ex works: 90's, 2s. 6d.; pure, 2s. 8½d.; nitration grade, 2s. 10½d.

Carbolic Acid. — Crystals, 11½d. per lb. Crude, 60's, 3s. 6d. to 4s. MANCHESTER: Crystals, 9½d. to 11½d. per lb., d/d; crude, 4s. 3d., naked, at works

Creosote.—Home trade, 6½d. to 9¾d. per gal., according to quality, f.o.r. maker's works. MANCHESTER: 6½d. to 9¾d. per gal.

Cresylic Acid.—Pale, 97%, 3s. 6d. per gal.; 99%, 4s. 2d.; 99.5/100%, 4s. 4d. American, duty free, 4s. 2d., naked at works. MANCHESTER: Pale, 99/100%, 4s. 4d. per gal.

Naphtha.—Solvent, 90/160°, 2s. 10d. per gal. for 1000-gal. lots; heavy, 90/190°, 2s. 4d. per gal. for 1000-gal. lots, d/d. Drums extra; higher prices for smaller lots. Controlled prices.

Naphthalene.—Crude, ton lots, in sellers' bags, £8 1s. to £12 13s. per ton according to m.p.; hot-pressed, £14 15s. to £15 14s. per ton, in bulk ex works; purified crystals, £28 to £43 5s. per ton. Controlled prices.

Pitch.—Medium, soft, home trade, 100s. per ton f.o.r. suppliers' works; export trade, £7 10s. per ton f.o.b. suppliers' port. MANCHESTER: 100s. f.o.r.

Pyridine.—90/140°, 18s. per gal.; 90/160°, 14s. MANCHESTER: 17s. to 20s. per gal.

Toluol.—Pure, 3s. 2½d. per gal.; 90's, 2s. 4d. per gal. MANCHESTER: Pure, 3s. 2½d. per gal. naked.

Xylol.—For 1000-gal. lots, 3s. 3½d. to 3s. 6d. per gal., according to grade, d/d.

Wood Distillation Products

Calcium Acetate.—Brown, £15 per ton; grey, £22.

Methyl Acetone.—40/50%, £56 to £60 per ton.

Wood Creosote.—Unrefined, from 3s. 6d per gal., according to boiling range.

Wood Naphtha.—Miscible, 4s. 6d to 5s. 6d. per gal.; solvent, 5s. 6d. to 6s. 6d. per gal.

Wood Tar.—£6 to £10 per ton.

Intermediates and Dyes (Prices Nominal)

m-**Cresol** 98/100%.—Nominal.

o-**Cresol** 30/31° C.—Nominal.

p-**Cresol** 34/35° C.—Nominal.

Dichloraniline.—2s. 8½d. per lb.

Dinitrobenzene.—8½d. per lb.

Dinitrotoluene.—48/50° C., 9½d. per lb.; 66/68° C., 1s.

p-**Nitraniline.**—2s. 5d. per lb.

Nitrobenzene.—Spot, 5½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—1s. 2d. per lb.; P.G. 1s. 0½d. per lb.

o-**Toluidine.**—1s. per lb., in 8/10-cwt. drums, drums extra.

p-**Toluidine.**—2s. 2d. per lb., in casks.

m-**Xylidine Acetate.**—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON.—July 28.—For the period ending July 31, 1948 (August 14, 1948, for refined oils). Per ton, naked, ex mill, works or refinery, and subject to additional charges according to package; LINSEED OIL, crude, £200. RAPESEED OIL, crude, £190. COCONUT OIL, crude, £106 refined deodorised, £112 refined hardened deodorised, £116. PALM KERNEL OIL, crude, £105 10s., refined deodorised, £112; refined hardened deodorised, £116. PALM OIL (per ton c.i.f.), in returnable casks, £99 5s.; in drums on loan, £98 15s., in bulk, £97 15s. GROUNDNUT OIL, crude, £110 10s.; refined deodorised, £114, refined hardened deodorised, 40 deg. £118. WHALE OIL, refined hardened, 42 deg., £117; refined hardened, 46/48 deg., £118. ACID OILS, Groundnut, £94; soya, £92; coconut and palm-kernel, £97 10s. ROSIN: Wood, 40s. 6d. to 48s.; gum, 56s. to 62s. 6d. per cwt., ex store, according to grade. TURPENTINE, American, 87s. per cwt. in drums or barrels, as imported (controlled price).

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None of the vacancies in these columns relates to a man between the ages of 18 *and* 50 *inclusive, or a woman between the ages of* 18 *and* 40 *inclusive, unless he or she is exempted from the provisions of the Control of Engagement Order, or the vacancy is for employment exempted from the provisions of that order.*

NEWCASTLE-UPON-TYNE AND GATESHEAD GAS COMPANY

WORKS MANAGER, TAR AND BENZOLE WORKS

APPLICATIONS are invited for the above position. The selected candidate will be responsible for the operation and upkeep of plant distilling 30/40,000 tons tar and refining 500,000 gallons of benzole per year, and for the control of labour employed.

Experience, qualifications, age and present employer should be stated and references given by applicants.

Commencing salary £1250 p.a. to suitable man: a satisfactory report by the Company's medical officer, and participation in the Company's superannuation scheme will be conditions of engagement.

Applications to be sent to the GENERAL MANAGER AND CHIEF ENGINEER, 30, Grainger Street, Newcastle-upon-Tyne 1, not later than Saturday, August 21st, 1948.

SENIOR Physical Chemists and Physicists, age 25/40, required for research work in London district by large firm of chemical manufacturers. Experience in the fields of colloid chemistry, thermodynamics phase equilibrium, distillation or gas separation desirable but not essential. Good salary and prospects. Pension scheme. 5-day week. Apply, stating qualifications, experience and age to Box R6481, A.K. ADVG., 212a, Shaftesbury Avenue, W.C.2.

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CHEMICAL ENGINEER or Chemist, with knowledge of Heat Transfer, required by North London manufacturers of domestic appliances. Good prospects for the right man, who will be required for research work in laboratories. Apply, in writing, to R. & A. MAIN, LTD., Gothic Works, Angel Road, Edmonton, N.18.

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A salary commensurate with qualifications and experience will be paid and applicants should be about 30 to 35 years of age.

Replies, giving full details of training and experience should be addressed to the EMPLOYMENT AND WELFARE MANAGER, Johnson & Phillips, Ltd., Charlton, London, S.E.7., and will be treated in strict confidence.

PHYSICIST or Physical Chemist required by North London manufacturers of domestic appliances. Good prospects for the right man who will be required for research work in laboratories. Apply, in writing, to R. & A. MAIN, LTD., Gothic Works, Angel Road, Edmonton, N.18.

SENIOR DRAUGHTSMAN required in London by a firm of prominent chemical and general engineers. Applicants must be fully experienced and, preferably, have some knowledge of chemical plant. Apply, stating age, previous experience, and salary required, to Box No. 2685, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

THE Aluminium Development Association requires an Assistant Librarian for its technical library. Applicants should be aged 20-30 years; of good general education, at least to H.S.C. standard; knowledge of physics and chemistry essential, and of French and/or German desirable. Previous library experience an advantage. Initial salary up to £375 p.a., according to qualifications. Applications should be addressed to the TECHNICAL DIRECTOR, THE A.D.A., 33, Grosvenor Street, London, W.1.

WELL established progressive firm has vacancy for assistant to be trained for position of **Export Manager.** Experience and languages desirable. Offers with full curriculum vitae to Box No. 2684, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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CHARCOAL, ANIMAL and VEGETABLE, horticultural, burning, filtering, disinfecting, medicinal insulating; also lumps ground and granulated; established 1830; contractors to H.M. Government.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams, "Hill-Jones, Bochurch, London." Telephone: 3285 East.

METAL Powders and Oxides. Dohm Limited, 167, Victoria Street, London, S.W.1.

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GEORGE COHEN'S 600

CHEMICAL PLANT FOR SALE

ONE—Twin roll **DRIER** by N. V. Goudche of Gouda, Holland. Steam-heated rolls 3 ft. 11 in. long by 1 ft. 10 in. diam. Driven through enclosed gears by 6 h.p. motor, 440/3/50. Drier complete with fume hood, two discharge worm conveyors. Capacity, 60 galls. per hour.

Four—Cast iron plate and frame **FILTER PRESSES,** cake 36 in. square, frame 4 in. thick. 23 plates 1¼ in. thick. 3-in. flanged bottom inlet, oval section bottom drains 1 in. by ½ in., suitable for clamp bolts. Manual centre screw closing gear.

One—Double tube **ROTARY DRIER** by Vickers Armstrong, 52 ft. long by 7 ft. 6 in. diam. (internal tube approx. 3 ft. 6 in. diam.), outer shell ½ in. riveted steel plate with internally bolted flights. Drive by 50 h.p. Brook totally enclosed slip-ring motor, 440/3/50, through David Brown Radicon reduction gearbox, 50 h.p. Complete with brick furnace approx. 16 ft. long by 10 ft. by 10 ft., and Babcock and Wilcox chain grate stoker, 54 in.

Three—Unused aluminium **DRYING CABINETS** by J. Glover, each cabinet has 4-heat insulated compartments equipped with individual doors, four 2 ft. 2½ in. by 1 ft. 9 in. tubular aluminium shelves in each compartment. 9 in. square ducting fitted to top and bottom of each cabinet for inlet and outlet of hot air.

One—**PREHEATER** by Waugh. 8 kW. for 230 volts supply. Arranged with 2-in. connections and two arms for wall support. Complete with separate thermostat range 100/250 deg. F.

One—Chambers 12-compartment steam **DRYING OVEN,** 7 ft. high by 6 ft. wide by 3 ft. 6 in. deep overall. Each compartment 28 in. wide, fitted with drop door and two racks to take trays 28 in. wide by 35 in. by ¾ in. deep, ½-in. steam coil in each compartment connected to 1-in. pipe each side of oven.

Several—2000-litre **EARTHENWARE VESSELS,** approx. 5 ft. 6 in. by 4 ft. diam. by approx. 1½/1¾ in. thick, and 3000-litre Earthenware Vessels, approx. 6 ft. 2 in. by 4 ft. 10 in. diam., approx. 2 in. thick. Open-topped, fitted with loose fitting domed cover having 8 in. centre hole with loose lid, and two 2-in. inlets, one 1½-in. bottom side outlet.

One—Brierley, Collier & Hartley steam-heated **MIXER,** vertical screw lifting gear to pan arm, capable of holding 18 in. diam. Pan. Spring relief valve, pipes and fittings.

One—Vertical cylindrical m.s. riveted steam-jacketed **MIXER,** 5 ft. diam. by 4 ft. 3 in. deep by ⅜ in. plate, dished bottom. Vertical agitator shaft carrying two paddle agitators running in footstep bearing and overdriven through bevel gears, mounted on single horizontal shaft.

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JACKETED Steel Vacuum Oven 7 ft. long by 3 ft. diam. Unused Weir Surface Condenser (G.M.) 138 sq. ft. Melvin 3 Speed 80 q uart Bowl Mixer. Jacketed C.I. Mixing Pan 4 ft. 6 in. by 2 ft. 6 in. Welded Steel 5,000 Gallon Cyl. Tank.

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ONE—36-in. Broadbent all electric latest type laundry or textile Hydro Extractor, with 7½ h.p. motor, 400/3/50 cycles, new Ellison switch gear, interlocking cover (as new).

ONE—New and unused Gardner "RAPID" steam-jacketed Mixer and Dryer, 6 ft. long by 2 ft. 3 in. wide by 2 ft. 6 in. deep, gear wheel and pinion from F. and L. pulleys.

ONE—New "MORWARD" Powder Mixer, with trough 6 ft. long by 2 ft. wide by 2 ft. deep, driven through gearbox from 5 h.p. motor, 400/3/50 cycles.

THREE—4-pot stainless steel Ball Grinding Mills, with two containers 1 ft. 2 in. dia. by 1 ft. 3 in. deep and two 9 in. dia. by 10 in. deep, driven through vee ropes from new 2 h.p. Laurence Scott motors, 400/3/50 cycles.

SIX—Pfaudler enamel lined steam-jacketed Pans, 3 ft. 3 in. dia. by 1 ft. 3 in. deep, hemispherical, 30 lbs. per sq. in W.P.

MORTON, SON & WARD LTD.
WALK MILL, DOBCROSS, Nr. OLDHAM.
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BELT Driven Elevator, steel cased, 2 ft. by 1 ft. by 16 ft. long, 14 ft. centres, 6 in. belt steel buckets 5 in. by 4 in. by 3½ in. by 12 in. centres feed hopper, fast pulley. Price £75. THOMPSON & SON (MILLWALL) LTD., 60 Hatcham Road, Ilderton Road, S.E.15. Phone: East 1844.

BIRLEC Activated Alumina Dryer for combustible gases or air capacity 8,000 c.p.h. to—40°C. dewpoint, electrical reactivation. Twin dryers with cooler, transformer instrument panel. In good condition, price only £265. Apply in writing to H. GREEN, 35, Dryclough Road, Crosland Moor, Huddersfield.

DISINFECTORS Two 8 ft. by 5 ft. diam. jacketed. Four 7 ft. by 3 ft. diam. with coils, Two Oval 50 in. by 30 in. by 7 ft. jacketed. New condition. THOMPSON & SON (MILLWALL) LTD., Cuba Street, London, E.14. Tel. East 1844.

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12 Vertical Weir & Hall Steam Pumps.
Several small steam-jacketed Copper Pans.
Several Ball Mills, 6 ft. 6 in. by 6 ft. 8 in., Silex-lined batch type, with driving gear and clutch.
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Lacey-Hulbert Motorised Compressor, capacity 4 cu. ft. 2,000 lb. pressure.
Mixing Pan, 6 ft. dia. by 5 ft. deep, flat bottom, open top.
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2—6 in. Centrifugal Pumps by Cherry.
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Milton Grinders fitted with 30 in. vertical stones, belt driven with shaker feeds.
1 Iwel 20 in. Turbine Centrifugal Extractors with spare baskets.
20 steel built Portable Soap Frames 15 in. wide, mounted on wheels.
Steam Jacketed Gardner pattern Mixer about 30 gallons capacity.
Brook 60 h.p. A.C. motor, 346/3/50.
Brook 80 h.p. A.C. motor, 346/3/50.
4 vertical Hall Ammonia Compressors, single cylinder, belt driven cylinders 3 in. to 5 in. bore.
3 Alfa-Laval Disc Separators, belt driven, size 45 and 65, with chambers 12 in. and 15 in. dia.
2 unused belt driven Ram Pumps, fitted one ram 1¼ in. dia., 3 in. stroke, brass fitted.
Alpine type Perplex Grinder, chamber 20 in. dia.
Ditto similar, chamber 18 in. dia.
Single pair toothed Crushing Roll, belt and gear driven, last used for soap crystals.
4 Steam Jacketed Mixing Pans.
1 20 cwt. Friction Hoist, complete with wheel and jib.
Several A.C. motors, 3–10 h.p.

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EXCELLENT CONDITION STORAGE TANKS

5 Closed M.S. Tanks, 20 ft. diam. by 12 ft. high, $\frac{11}{16}$ in. plate, fitted with stirring gear and 3½ h.p. G.E.C. motor and starter, fan-cooled reduction gear, steel footplate and handrails; also 350 ft. of R.S. Joist Supports to each vessel.

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BROADBENT 48-in. HYDRO EXTRACTOR, vulcanised basket, electrically under-driven 3-point suspension. Complete with starting equipment, fitted reverse current braking switch.

BROADBENT 48-in. HYDRO EXTRACTOR, with 48-in. galvanised iron basket, complete as above.

BROADBENT 48-in. SUSPENDED TYPE HYDRO EXTRACTOR, overdriven from 15 h.p. motor 400/3/50 supply, together with Pony motor for slow running.

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JOHNSON TIMBER PLATE AND FRAME FILTER PRESS, 28 plates and 29 frames, cakes 2 ft. 1 in. square by 1¼ in./closure (two available). Double toggle.

CANNING ALL RUBBER PLATE AND FRAME FILTER PRESS, having 5 plates and 6 frames in hard, pliable black rubber, forming cakes 13 in. by 10 in. by ⅝ in. thick. Press complete with C.I. head and standard vulcanised over contact faces and outer edges.

18-in. DIA. WILKINSON OINTMENT MILL, with marble refining discs and enamelled hopper and agitator and complete with driving motor.

TUNGSTONE ACID PUMPS, a number available in ebonite, bronze and tufnol.

NEWMAN INDUSTRIES LIMITED,
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1000 STRONG NEW WATERPROOF APRONS, To-day's value 5s. each, Clearing at 30s. dozen. Also large quantity Filter Cloths, cheap. Wilsons Springfield Mills, Preston, Lancs. Phone 2198.

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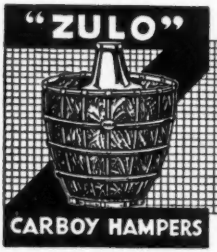
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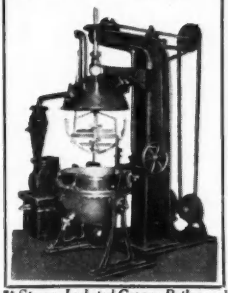

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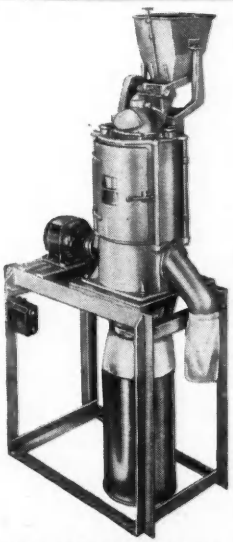

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